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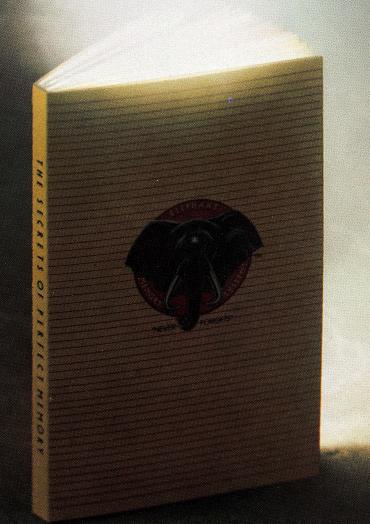
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# APPIGO

Volume 4 Number 8 / November 1983

Cover: Justice and Apple Triumphant!

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APPLE ORCHARD is an independent worldwide publication of the International Apple Core. Our existence is derived from the users of Apple and Apple-compatible computers, and it is their interests which we serve.

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Music, Music, Music WordStar Patches More on WPL

# Apple Orchard

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November 1983

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### Textfile

This month, we focus on the relationship between Apples and the law, or perhaps more accurately, some aspects of that multilayered relationship. Toronto barrister Clifford Schnier covers an exciting field of use for our favorite machines in "Mastering the Mountain of Documents". Martha Gore follows with a look at copyrights as they affect and are affected by computer software. And Contributing Editor Barry Bayer, a Chicago area attorney, tells us about the current status of a legal case of great interest in the Apple community, Apple v. Franklin.

And then there's Lisa. Apple's top-of-the-line machine has been unbundled from its \$10,000 package, and reduced in price. With a great deal of help from Scott Knaster, our old friend Alan Anderson takes time away from his Apple /// to explain Lisa's features. The graphics were also created with a dot-matrix printer driven to graphic greatness by Lisa (just like a woman!). We strive for authenticity.

Apple /// owners haven't been left out: although Apple's clock conversion kit is likely to be out by the time you read this, we wanted to share with you a method of installing a clock in your ///. Arthur Anderson gives us the inside look. Arthur, or "Skip", as he prefers it, is the author of the CPM-SOS transfer program that the IAC has for sale. He's no relation to Alan Anderson, and is not an accountant. Neither is Gene Wilson, who tells us about a half-meg disk drive from Micro-Sci that makes working with the Apple /// a pleasure by allowing mass storage. That's 560K bytes, as opposed to Baby Blue's 390K.

Neil Lipson reports on three separate products this month: the exciting Videx Ultraterm card, the Copywriter program, and an accessory called the MacInker that can make you the most popular kid on your (circuit) block. And Michael Wolgelenter, with very little assistance from his immediate maternal ancestor, looks at Krell's SAT preparation program.

If you have ever wanted a simple way to find out what's on a text file (something like the TYPE command in CP/M, I'm told), Andre Babeanu of POMs shows us the way, in Applesoft. A language comparison and a few thoughts on dBase II from Al Azose round out this issue, leaving just enough room for The New Stuff's extensive new (and updated) product information.

The response to Apple Orchard's "new look" has been most exciting and gratifying; we thank those of you who took the time to let us know of your reactions. As you'll note, more upgrades are to be found in this issue, and we're still not through. We'll probably never really be finished making improvements.

One more thing: our cartoonery fellow, Jim Linhart, came by the other day and described "disorientation" as the feeling you get when you see an Epson computer hooked up to an Apple printer. Trudge the good trudge, Jim.



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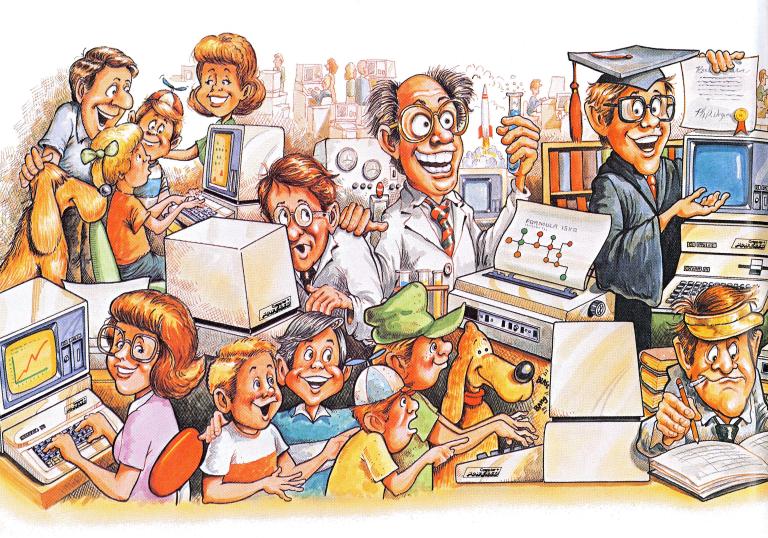
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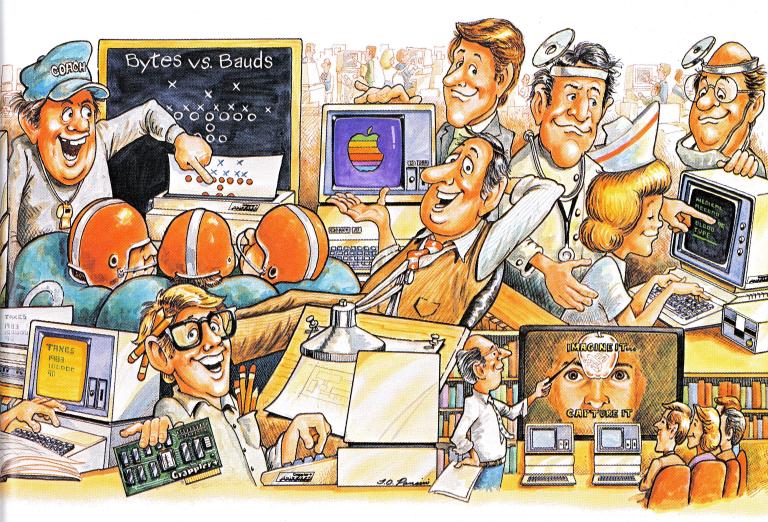
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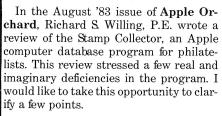


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## Ask Us/Tell Us

Address your questions, answers, and comments to:

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Over a year ago, the reviewer received a complimentary preliminary prototype copy of the Stamp Collector. It was explained that the copy was not the final product. The August review did not make mention of this, but used this prototype as the final product and sole basis for the review. The deficiencies the reviewer reported in documentation have long since been corrected.

The Stamp Collector disk comes with six programs: Foreign stamps, Domestic stamps, Sources list, Meetings lists, a generic Data Base and File transfer program. The first four programs are preformatted, independent, standalone programs, not examples as mentioned by the review. The file transfer program is not used for sorting; it transfers data files from disk to disk or over the modem. Sorting is done as part of the data base programs.

The system will work with one floppy disk drive or a hard disk. It will operate all commonly used printers (40, 80, 132 column) and has special options for use of compressed print (132 columns on 80 column paper) for the Epson, IDS, and Centronics printers. The programs are unlocked (can be copied with CopyA), listable and changeable to meet unique needs.

It is unfortunate that the review author chose to overlook these points and knowingly wrote a review based on an antiquated prototype copy, when more updated versions were available. Of course, I'm biased, but I think the Stamp Collector deserves another look.

E. J. Neiburger Andent, Inc. 1000 North Ave. Waukegan, IL 60085 I am an Apple /// ProFile user, and I have for some time looked for an encryption program for the Apple ///. It seems that what I have seen so far is for the Apple II or for CP/M. Who has written encryption software for the Apple ///? Dr. Marino H. Mueller, Esslingen, Switzerland.

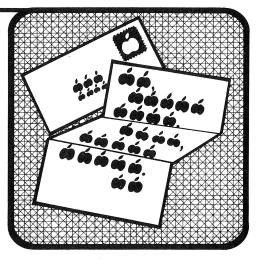
Well, who knows about this? Drop us a line; we'll forward it to Dr. Mueller and mention it here. We'd like to cover encryption in an article too. —*PCW*.

As an Apple II and //e owner and as a subscriber to your publication for 2 ½ years now, I have been increasingly disappointed in the lack of Pascal features in Apple Orchard. As far as I am concerned, Pascal is the only way to fly for serious programmers with serious business applications. Structured Programming facilities are a major strength of Pascal. Lack of same is a major weakness of BASIC. I have nothing but scorn for the article on "Structured Programming" in your August issue. You were talking about structured programming in BASIC without even mentioning Pascal. —James A. Kirk, Westminster, CA.

Thank you, Mr. Kirk; you're right. We should have more stuff on Pascal. And we will.—*PCW*.

I just recently bought an Apple //e Personal Computer and I would like to know what ways I can invest into it and make a profit in the future? Also, I know some obvious advantages and disadvantages of owning a computer for personal use. Could you please tell me some other advantages and disadvantages of owning a personal computer? Thank you. M. A., Rialto, CA.

The most obvious disadvantage of owning a personal computer is the difficulty of explaining to others about how the ma-



chine helps you. We've called it a "mind amplifier", and it's the most powerful tool you'll have, for whatever you want to do. What you invest in it is time; time to learn about the machine and programming. Even Pascal, if you like. Your knowledge will help you profit in the future whether you write a software application program, design a future computer, or just use your skills in any profession or field you select. Space doesn't permit a full discussion; it'll be taking place in this magazine over the next few years. My advice remains: do more, learn more with and about your computer. It'll help you all your life.—*PCW*.

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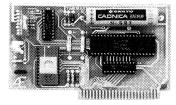


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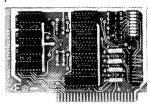
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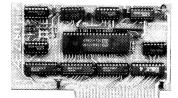
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- We give you lots of software. In addition to Compose and Play programs, 2 disks are filled with over 30 songs ready to play.
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VIEWMASTER	169	YES	YES	YES	YES	YES	YES	YES	
SUP'RTERM	195	NO	YES	YES	NO	NO	YES	YES	
WIZARD80	245	NO	NO	YES	YES	NO	YES	YES	
VISION80	375	YES	YES	YES	YES	NO	NO	NO	
OMNIVISION	295	NO	YES	NO	NO	NO	YES	YES	
VIEWMAX80	219	YES	YES	YES	YES	NO	NO	YES	
SMARTERM	360	YES	YES	YES	NO	NO	YES	NO	
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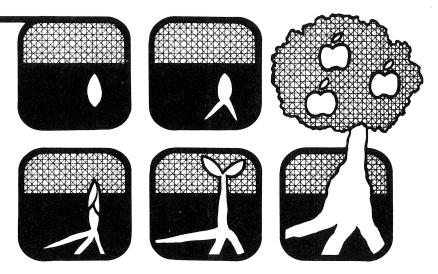
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# **Planting** a seed





## Did the Apple do it?

It all started out very innocently.

Tom developed a small program in the early days of Appledom, and his friend Joe was interested. "Sure, here's a copy", said Tom, handing Joe a cassette tape containing the program. (You can tell it was the old days, before disk drives.) The real names of the players have been lost to history, but that was how the first transfer of a program from one person to another occurred.

In those early days, hardly anybody bothered with copyrights, lawyers, etc.; it was a sharing among friends of their collective endeavor. And the friends made improvements to the software, which was cycled back to the original developer. User Groups facilitated this cameraderie. Everybody was happy; it was Eden, with the Apple playing a large part.

Then somebody mused, "Gee, maybe we could sell some of these programs. Enter the serpent, stage left. Commercial software began to appear. Many bought it. But some continued the "tradition" of giving copies to their friends. Some dealers are said to have thrown in copies of programs to sweeten computer sales. The people who ran the embryo software companies quickly lost all traces of cameraderie, adopting instead a protective coating of Moral Fervor. This, after all, was theft!

Meanwhile, Jim got a modem for his Apple, which connected him to the Bell telephone network. Remembering stories from his older brother about fun and games with "blue boxes" and long distance calls, Jim tried to gain access to another modem that wasn't expecting him to call. After much trial and error, Jim cracked the entry codes, and was talking to . . . well, that didn't matter. The important challenge was getting through. Jim told Harry about it, and Harry went one step further: he got through, and then left a message in the memory suggesting that the reader perform an impossible sexual feat. Great fun! Charlie heard about this, cracked his university's computer, and tried to change one of his grades from C to B. (Just a B; no sense being greedy.)

The software merchants, meanwhile, developed technical barriers to disk copying by varying the bit patterns on their disks. Thus armed, they watched profits grow. (It made no difference that some of these entrepreneurs themselves had large collections of other people's software, acquired through electronic samizdat.) Now, backup disks were available, at \$30 and more, if your protected program disk crashed.

That offended another legitimate interest: the honest purchaser who wanted nothing more than a backup disk was now being penalized because of the threat of multiplying copies. The irony was, of course, that knowledgeable persons were cracking protection schemes right and left. Broken copies of everything were, and are, everywhere, despite technical escalation of protection. Copy protection is an illusion of security.

Now we have the mass media concentrating on "computer crime", as if the personal computer were somehow ushering in a New Age of Lawlessness. We hear of thefts by shortcircuiting electronic funds transfers; access to computers everywhere, including sensitive government facilities; computers used to aid in recordkeeping for illegal activities; and that appears to be only the beginning. Chilling.

It's just not innocent any more, is it? What's ludicrous, however, is the growing thought among TV reporters and other superficial thinkers that somehow the *computer* is responsible for all this. Now, we know that the computer is a tool; it can be used for good or evil. So is a crowbar, an axe, a key, or a fountain pen. If the computer has become a burglar tool, it's because burglars use it. People.

Go back to Genesis again and ponder: was the Apple at fault, or was it merely a neutral participant in the human tragicomedy?

Pellegli

# The Lisa Nobody Knows

#### by Alan Anderson and Scott Knaster

ou're reading yet another article about Lisa, Apple's latest and greatest entry into the world of personal computers. What else is there to say? When Lisa was launched last January, virtually every major computer magazine featured lots of stuff about Lisa and how revolutionary it was. Apple Orchard, Byte, Personal Computing, and Popular Computing featured the new Lisa on their covers. Even Time and Newsweek, not what you'd call typical computer journals, devoted space to the Lisa announcement, as did other publications.

If you read any of the magazine articles surrounding the Lisa introduction in January, you probably feel you have a pretty good idea of what all the fuss is about. Lisa's remarkable new features have been much-heralded; the ability to display multiple "windows" of different software applications; a pointing device called a mouse; extremely detailed graphics; data transfer between applications.

Since that announcement, other software products have been introduced which duplicate some of these features. The most well-known is VisiOn (guess who makes it), which has a mouse and windows and data transfer, as well as its own new applications. As of this writing, VisiCorp says that VisiOn will be available at the end of October. VisiOn was actually presented to the world last November, two months before Lisa, but Lisa has been shipping since June. Desq, from a new company called Quarterdeck, features a new twist: it takes existing applications like Wordstar and VisiCalc and lets you window them and transfer data between them.

When the computer press mentions "integrated software" these days, Lisa is usually lumped in with those others. How similar are these products to the Lisa? Should they be grouped together? Well, the natural human tendency is to pigeonhole and categorize, and things which defy categorization are troublesome, so we search for similarities between things which may not be so similar after all.

Lisa is one of those things that stands alone. A quick 20minute demo by a knowledgable Lisa user shows how unique it really is. Its design and features are totally different from anything else that's available now. But if this is true, why don't most people in the computer industry recognize it? One answer is that Lisa's revolutionary design appeals mainly to two kinds of people: those who know a great deal about the human characteristics of designing software, and those who have never used a computer and wouldn't know a byte if it came up and byt them. Most of the people in the computer industry today don't fit into either of those categories.

If you think that most of the microcomputer industry today knows a lot about designing a good human interface to software, take a good hard look at the software you're using. If you've been using computers for more than a few months, it might be hard to see this inherent flaw in most of today's software because you've become accustomed to it. If you've only had your computer for a short time, you probably know exactly what I mean. Most of today's computer programs are like dictators, demanding that things be done their way, requiring an astonishing array of secret codes to perform functions, and worst of all, promoting the need to learn computerese in order to get anything done.

Hard-to-use software is not necessarily the fault of poor design of applications. Part of the blame is due to fact that most of today's operating systems are several years old. Another problem is in hardware limitations. Remember that Lisa costs \$10,000 and features very impressive hardware specs that we'll discuss later.

With Lisa, Apple has taken a gutsy step, because Lisa abandons most of the current ways of doing things for a whole new world. This is dangerous for Apple because it requires those who know how to use computers already to forget all the black magic they've learned and take on a new, simpler way of doing things. Apple's premise is this: using a Lisa is considerably easier than using any other personal computer, and if you're one of the vast majority who've had limited experience with computers, vou'll appreciate it immediately. But if you already know about DOS and CP/M and device drivers and control codes and all the other wonders of the personal computer age, it may take you a bit longer to appreciate it.

#### **Family Trees**

When Apple designed the Apple ///, it was constrained by the Apple II. The /// was an evolution of the Apple II. One of its features allows it to emulate the Apple II, and while it is certainly much more powerful than its predecessor, it performs basically the same functions as the II—faster, more powerfully, and with more memory, but fundamentally in the same way.

With the Lisa, this restraint was removed. No compatibility with previous systems was required. And so Lisa's designers took off. If you're a fan of fancy hardware, it would be hard to come up with much better specifica ions: MC68000 microprocessor, 1 megabyte of RAM, 1.7 megabytes floppy disk, 5 megabytes hard disk, 12 inch bitmapped display with over 250,000 pixels, detachable keyboard, one-button mouse, real-time clock, 2 serial ports, and 3 expansion ports.

But the Lisa's hardware is only the foundation for the real breakthrough: the software. Apple likes to say that Lisa's hardware is only state-of-the-art, but the software is revolutionary. The more well-known features of this software, the mouse and the ability to run more than one application at a time by using windows, have already been mentioned. Now we're going to spend some time discussing some of the lesserknown features of the software, some of the more subtle things that make the Lisa so powerful and easy to use—and the things that truly set Lisa apart from the other "integrated software" packages.

In Figure 1 you see the Lisa Office System as it first appears. The thin white strip across the top is called the menu bar, and the gray remainder of the screen is called the Desktop. The pictures at the bottom of the Desktop are called icons. Icons are a fundamental part of the Lisa user interface. They represent some action or piece of data used by the Lisa. In Figure 1 you see the four icons which are always present on the Lisa. The first, ProFile, obviously represents the ProFile hard disk which is attached to the Lisa. The one that looks like a Lisa and is named Preferences is used to set things like the volume of the Lisa's speaker, how fast the keys repeat, and what devices you have connected, such as printers and modems. The Clipboard icon holds data which is being moved from one place to another. And the Wastebasket icon-well, it almost seems silly to have to say so, but of course, the Wastebasket is where you put something when you want to get rid of it.

One more very important thing that you can see on the Desktop is a small black arrow. This arrow (which points north-northwest, trivia buffs) is called the pointer, and it is intimately related to the mouse. When you move the mouse on the desktop, the pointer moves in a corresponding direction. The mouse and its arrow are used to point at things on the Desktop to select them for some action.

You may be wondering how you get an icon to perform a function, how to make it do something. Well, each icon represents a "location", a place where the Lisa's user can put things. In order to see into these places, each icon can be opened; that is, a sort of electronic magnifying glass can be placed on the icon, letting you look inside it. For example, we can look inside the ProFile icon and see what's there. This is where the mouse pointer comes in. First, we move the pointer so that the tip of the arrow is touching the icon and we press the button on the mouse.

After we press the button, the icon becomes highlighted on the Desktop, and it turns black. Now we move the pointer up to the top of the screen, the menu bar. Each item in the menu bar represents a menu, or list of things to do. In order to see a menu, we point at the menu's title and press the mouse button. As we hold the button down, the menu appears below its title, in this case, the File/Print menu. As we point at each menu item, it becomes highlighted, just like the ProFile icon when we selected

Figure 2 shows you what the File/ Print menu looks like when it's pulled down. You might notice that some of the menu items appear to be gray, while others appear black. This is because the items which cannot be used at a particular moment are automatically locked out. When we point at these dim items. they stay dim—they don't become highlighted. One item in the list, the one at which we're pointing, is highlighted.

When we come to the item we're after, in this case the one that says "Open Pro-File", we release the mousebutton. Instantly, the action we've chosen takes place. As we watch, the tiny ProFile icon zooms "closer". In a fraction of a second. it seems to grow until it fills about half the screen (see Figure 3).

Now we're looking inside the ProFile and seeing what's kept there. If you've ever been to Disneyland, what's happening here is a lot like the Adventure through Inner Space, where a snowflake appears to grow larger as you apparently shrink into it. Well folks, this is the ultimate E-coupon attraction, as you can see by looking at the contents of the ProFile in Figure 3. It's filled with more icons, this time icons that look like file folders. Each file folder has a name: some of them contain examples, such as LisaCalc Examples, LisaDraw Examples, and so on; one of them is called Apple Orchard, and we'll be working with that one shortly. As you probably guessed by now (after all, this is supposed to be intuitive), the file folder icons act like real file folders: they hold things.

One icon looks like a whole stack of file folders, and it's called Empty Folders. This is a special kind of icon called a pad. It represents a whole bunch of file folders, an infinite number of them, and whenever you want one, you just point at it, click the mousebutton to select it, and choose Tear off Stationery from the File/Print menu.

As we ponder how to look inside the file folder called Apple Orchard, an interesting thing happens, something we might call the Lisa deja vu effect. Deja vu, of course, is feeling of strange familiarity, as if we've been here before. Last time we wanted to open an icon, to see what was inside it, we selected it with the mouse and then opened it from the File/Print menu. Now here we are again, wanting to open an icon. Of course, the answer is easy. We point at the icon and click the mousebutton to select it, then pull down the File/Print menu and choose Open "Apple Orchard". Just like before, the folder appears to zoom open and becomes a window, showing us what's in the folder (see Figure 4).

Before we discuss the contents of the Apple Orchard folder, lets talk about windows for a while. If you look at the Apple Orchard window in Figure 4, you'll see that there's an unusual looking little box in the lower right corner of the window. This is called the sizing box, and it's used to change the size of the window. Almost every window has one. That means that you can make the window larger or smaller, whatever you like. If you make the window too small to see everything that's inside it, you can use the arrows next to the sizing box. called the scroll controls, to roll the window left, right, up, or down.

You may also have noticed that the Apple Orchard window overlaps the Pro-File window. The Lisa Office System lets you put things on top of other things. (They must have used my desk as a model.—PCW.) If you want to look at something that's covered up, all you have to do is point at it and click the mousebutton, and it will be uncovered. You can also move icons and pointers around, putting them anywhere you want them. If you want your ProFile window to appear on the bottom part of the Desktop rather than the top, just point at the top line of the window (called the title bar), grab it by holding down the mousebutton, and drag it down to its new location.

Now lets look at what's inside the Apple Orchard folder. There are three icons inside: 1984 Budget, Staff list, and Memo. These icons look like pieces of paper. Each one represents a document. A document is where a Lisa user does work. For example, the document called 1984 Budget contains a budget for one year. The icon shows which of the Lisa application programs, or tools, as they're called, was used to create this document. The spreadsheet design on the 1984 Budget document tells us that the LisaCalc tool was used to create that document. The Staff list icon indicates that it was created with LisaList, while the design on the Memo icon shows that LisaWrite was used to create it.

If we wanted to get a look at the document called 1984 Budget, how would we do it? Once again, deja vu strikes. Here's an icon, a small representation of something that we want to look at more closely. One of the most important aspects of the Lisa design is consistency: it performs similar functions in a similar way. Here, once again, the Lisa is faithful to this philosophy. The document is opened by using exactly the same actions as we used in opening things before. We point at the document, click the mousebutton to select it, pull down the File/ Print menu and select Open "1984 Budget". You probably know what hap-

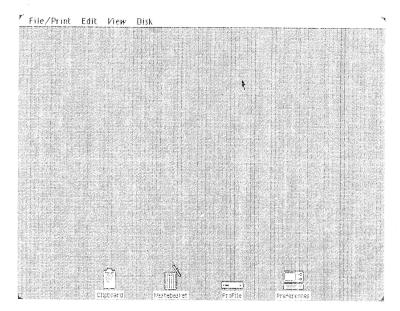


Figure 1

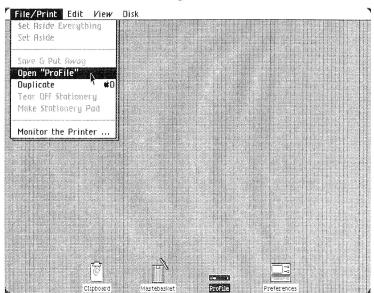


Figure 2

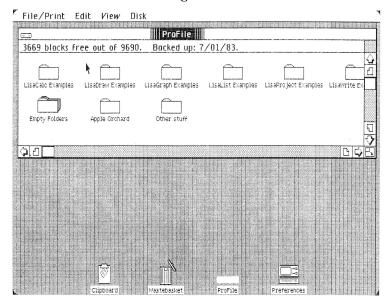


Figure 3

pens next. The icon zooms open into a window, and the window is entitled 1984 Budget. Inside the window is the message "LisaCalc is preparing this window's display." This message stays up for a while as the ProFile hums away; the pointer changes into an hourglass to show that the Lisa is busy; then the window is filled with the budget spreadsheet.

Let's step back for a moment and discuss what we've done so far. This time, though, let's examine our actions from a different point of view—we're going to compare them to similar actions on traditional personal computers. First, we looked at the contents of the ProFile hard disk. On a conventional computer, this is called a catalog or directory listing, and you get it by typing in a command. What's the command? Well, it's CATALOG, or CAT, or DIR, or FILES, or any of a bunch of other variations, depending on what computer and what operating system you're using. Of course, if you're using an application program, it might be something else, probably some control-character, if you can get it at all. And, of course, you can bet that whatever the command is in one program, it'll be completely different when using another program on the same computer. On the Lisa, there was no command. We simply pointed at the ProFile, then selected a menu item, all with the mouse. Number of keystrokes required: zero.

What if we wanted to look at the Pro-File contents while we were using one of the Lisa applications? The procedure is exactly the same. No matter what you're doing, even if you're right in the middle of entering a cell in LisaCalc or reshaping a polygon in LisaDraw, you can select the ProFile icon and open it. Of course, you can also leave the Pro-File's window open so that you can see the ProFile's contents all the time. If another window that you open covers up the ProFile window, just click in the Pro-File window and it becomes completely visible.

The ability to perform virtually any action (like looking at the ProFile's contents even while you're working on another document) is extremely powerful and quite unique in the world of computers. This capability, which is technically called being modeless, extends throughout the Lisa Office System. The Lisa tries very hard never to lock you into a "mode", in which commands suddenly do very different things than they

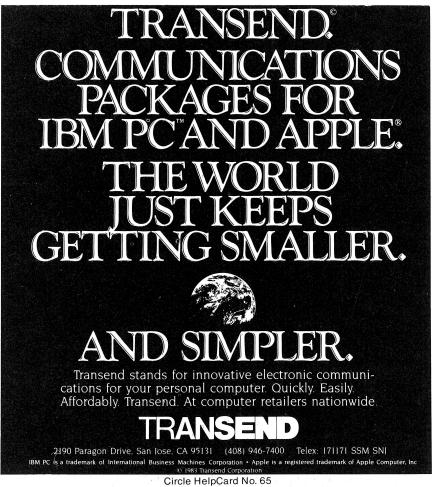
do in a different mode. This use of different commands is very disconcerting to the person using the computer and sometimes can destroy work ("Does CTRL-C accept or cancel?"). Consider, for example, many word processing programs which move the cursor by means of arrow keys. Most of the time, this movement simply repositions the cursor, but once the user gets into "delete mode", cursor movement suddenly gobbles up any text that's moved over. As I said, very disconcerting.

The Lisa Office System and its applications work hard to be modeless to avoid situations like this. The system of windows is a fundamental way to get away from modes. In the few cases where modes are used, the mode becomes a window. This changes an abstract concept (a mode, which you can't see) into a concrete one (a window, which you can see).

Let's continue to review the actions we've taken so far. After opening the ProFile, we wanted to look at the Apple Orchard folder. Following the same steps as before, we opened the file folder icon, and were then shown its contents. Although this action doesn't have a direct counterpart on other systems, it is very much like getting a listing of a subdirectory. Subdirectories, which are used by Apple ///'s SOS, Unix, and other operating systems which work with large disk drives, provide a way of grouping similar things, much like file folders in the Lisa Office System. Finding out what's in subdirectory usually requires a command a lot like the ones used for finding out what's in a directory.

After opening the Apple Orchard file folder, we decided we wanted to take a look at the document called 1984 Budget. In order to do that, we once again followed the procedure of selecting something (the document) and then performing some action upon it (opening it). The icon zoomed open into a window and the document became visible (see Figure 5).

How would we perform a similar function with a conventional system? Well, first we would have to enter some command to run a spreadsheet program from our hard disk. Then, after the spreadsheet was loaded, we would enter a command in the spreadsheet to load a file, then type in the file name.



Oops-what if we've forgotten the name of the file we wanted to load? No problem. Just enter the spreadsheet's command for listing a catalog. After you find the file's correct name, just go back to the spreadsheet's load command and type in the file's name. Counting the command which started the spreadsheet, we're up to about 15 keystrokes (it would have been more if we had used a name longer than 1984 Budget for our document).

By the way, for those of you who haven't been counting, we have so far used the Lisa's keyboard a grand total of . . . uh, we haven't used it yet. In fact, that's another cornerstone of the Lisa Office System's philosophy: the mouse is used for making the Lisa do things: the keyboard is used for entering text and data. This fundamental separation of tasks is one of the things which makes the Lisa so easy to learn and use. There are no cryptic commands to learn. Actions are performed in the simplest way possible, often by just pointing at the thing you want to work with, then selecting a menu item. The only time you have to go to the keyboard is when you want to type in some information.

Another interesting observation: with Lisa, you don't "run a program" and "load a file." These two actions are combined for you into one simple action: opening a document. This method has many advantages. One of the most important is that you never have to remember the name of a program or file. You never have to go through the frustration of knowing something is out there on the disk, but that you're just spelling it wrong, surely one of the cruellest tricks a computer can play on a human.

You may also have noticed that the names of documents and file folders are rather unrestricted. Unlike conventional systems, which usually limit you arbitrarily to short names composed of a small number of characters, Lisa names can be 63 characters long and can contain any of the characters you can type at the keyboard. By the way, the Lisa's keyboard is extremely versatile. In addition to typing all the standard typewriter characters, you can type lots of other symbols, including various common foreign characters, by using the Lisa's option key. This key acts as a second shift key to give you more flexibility.

I mentioned that the names of Lisa objects are limited to 63 characters. What happens if we try to exceed that

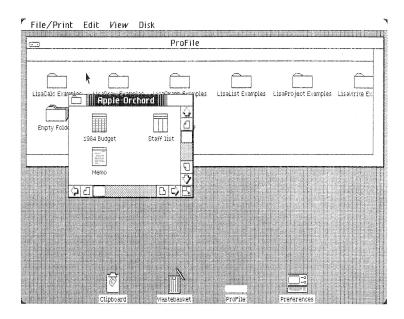


Figure 4

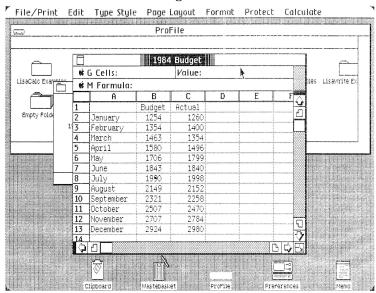


Figure 5

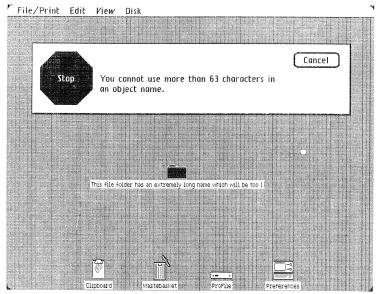


Figure 6



## "VersaForm" saved us hiring two people?

President, International Datawares, Inc.

My company, International Datawares, is a manufacturer and wholesale distributor of media storage devices for the computer industry. It has a line of over 62 different items dealing with media storage, mailing, shipping and

With more than 3,000 orders a year, the staff was often processing, shipping and invoicing 20 or more orders a day. Getting better operational control of the business, without adding more staff, became my biggest headache.

#### "It took a little searching. but I finally found VersaForm, the business database?"

What the business really needed was a powerful database manager that was easy to use. Impossible? Not at all. VersaForm gives our company the power and processing speed of a computerized database, combined with the simplicity and convenience of using our familiar business forms.

#### "Now we process everything that comes in or out of the business with VersaForm?"

VersaForm processes and records (and even prints, when necessary) everything that comes in or goes out of the business. Orders. Invoices. Packing Slips. Labels for shipment. The shipment itself. And then, it provides the best thing of all: monthly reports for our accountant!

VersaForm is like an electronic file cabinet that stores all this information, and puts it at my fingertips when I need it! And it's designed with a nontechnical user in mind, so we had none of the usual technical database headaches.

#### "Our accounting fees were cut in half...and the accountant loves it?"

Since all the business transactions are recorded with VersaForm, it takes just a little over an hour a month to

pull together every managing report that our CPA needs. Including the Sales Journal, Deposits for the month by day, Receivables Journal, Tax Liability Statement, even the Bank Reconciliation Statement.

This makes the work for our accountant so easy, the fees were cut in half, and his time is put to much more profitable use. (He loves it).

#### "Our full-time bookkeeper is VersaForm?

VersaForm does it all now. It locates. controls, and interrelates just about any kind of information. It handles customer orders and inventory. It fills out invoices, statements and mailing labels. It prints reports for the accountant, and does the calculating for these functions automatically. It even writes out the checks. In fact, it handles all the bookkeeping so efficiently, we thought

it was about time to start expanding. "Welcome to the line,

#### VersaForm?

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limit? I'm glad I asked that question, because if gives us a chance to see how Lisa handles error messages. You can see what happens by looking at Figure 6. Actually, the term "error messages" isn't really fair. Apple calls them alert boxes, and this is a typical example of what happens when something goes wrong. Note the oval marked "Cancel" on the right side of the alert box. As you probably figured out, by pointing at this oval (called a button) and clicking the mousebutton, the alert vanishes and uncovers whatever was behind it on the Desktop. That's what happens when there's an error: no muss, no fuss.

In order for the metaphor of the Desktop to be effective, it must truly allow us to manipulate things in the computer by using the icons. The Lisa Office System lives up to this expectation. For example, if we want to make a duplicate copy of any of the documents or file folders, such as Staff list, all we have to do is select the document by pointing at it and pressing the mouse button, then choosing Duplicate from the File/Print menu. This creates a new copy of Staff list, which we can then put into any file folder.

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The Lisa's floppy disk drives come to life any time we insert a diskette into either disk drive. After a few seconds a new icon appears on the desktop: it's a picture of a diskette. If we opened the diskette we would see that it contains file folders and documents, just like the ProFile.

What if we wanted to move a document from a diskette to the ProFile? Easy. We just point at the document and hold the mouse button down while we move the document over to the ProFile icon. Of course.

Now let's take a look at how some of the Lisa applications work. Right now our LisaCalc spreadsheet, 1984 Budget, is active. As I mentioned earlier, we have complete freedom over the appearance of the window. We can make it larger or smaller with the sizing box; we can move it anywhere on the Desktop. We can also scroll through the sheet with the scroll controls. If we want to enter values in some of the cells, we first select the cell by pointing at it and pressing the button; then we type in the value.

If we want to add something to an entry we've already made, here's the procedure. We select the cell by pointing at it and clicking. The pointer then changes appearance: it turns tall and thin (wish I could do that). This is called the text pointer. Now we point between the characters and click again. We can now type our added characters. It's important to realize that we have not been put into an "insert mode" which we can get stuck in. If we wanted to, we could move the pointer (it would change back into an arrow as soon as it was outside this cell) and select something else.

What if we want to delete some text? If you think we're going to get into "delete mode", you just haven't been reading very closely. To delete text, we first select it. We do this by pointing at the first character to delete, pressing and holding down the mouse button while we move the pointer to the last character, and letting up on the button. As soon as we let up on the button, the text we've selected is highlighted on the screen. Now we pull down the Edit menu and choose Cut. Zap! The selected text is gone. What happened to "delete mode"? There was none, so nobody will ever get hopelessly lost in it, deleting things they don't want to delete.

We've talked about insert and delete, and there's one other basic editing func-

tion: replacing some text with other text. For example, if we had typed "big old dog" and we wanted to change it to "big happy dog", we would first select the word "old" by pointing in front of the "o" and holding the button down while we move the pointer past the "d". Then we would simply type "happy", the replacement. Again, no modes in sight!

The best thing about these editing features is this: anywhere on the Lisa. anytime you need to edit text, these techniques work exactly the same way as they did here. Exactly. Always. Whether you're changing the name of a document, entering a phone number in a LisaList document, typing a letter with LisaWrite, or putting in your budget, text editing is consistent. The advantage of this is incredible. Instead of having to relearn basic actions in different applications, the same techniques are repeated throughout the Lisa Office System.

#### Integration without Busing

Another Lisa feature is the ability to take data from one document and put it into another. For example, if you've got a picture in a LisaDraw document that you want to put into a different Lisa-Draw document, Lisa lets you make a copy of the picture and paste it into the other document. You can also move information between some documents of different types—for example, you can make a copy of a schedule from a Lisa-Project document and paste it into a LisaDraw document.

Here, we're going to copy some of our 1984 Budget information and paste it into the LisaWrite document called Memo. In this case, we're after the information for January through September. Here's how we do it. First we point at one corner of the information we want to copy and hold the button down; we move the pointer to the opposite corner of the range of cells and release the button. This causes the cells between the two points to become highlighted on the screen (see Figure 7). Now we pull down the Edit menu and choose Copy. This tells the Lisa to make a copy of the selected cells. This is the information which we will paste into the Memo in a moment.

But wait! The Lisa is supposed to represent things as physical objects on a "desktop." If we've made a copy of this information, where is it? Well, it's inside another icon: the Clipboard. In fact, we

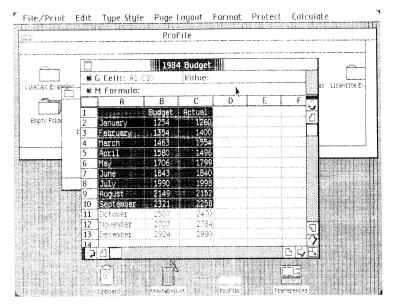


Figure 7

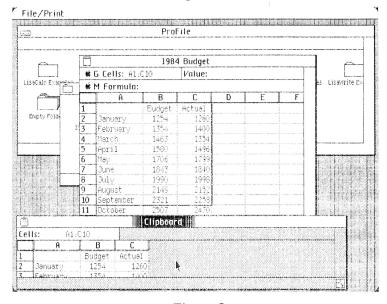


Figure 8

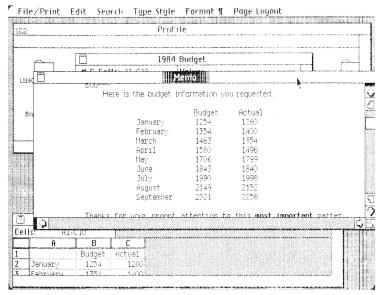
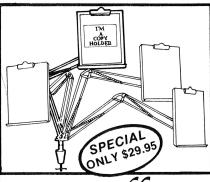


Figure 9

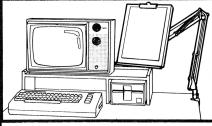
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can see it. If we point at the Clipboard icon, select it, and choose Open Clipboard from the File/Print menu, we see the cells we just copied from the 1984 Budget document (see Figure 8). Great!

Now we have to open the Memo. We can't see most of the Apple Orchard window (where the Memo document is filed), so we point at the part of the window we can see and press the mouse button. This uncovers the Apple Orchard window and makes it completely visible. Now we can select the Memo icon and choose Open "Memo" from the File/ Print menu, and it zooms open into a window. We point at the place in the Memo where we want the information to be placed, then click the mouse button to mark it. We pull down the Edit menu and choose Paste, and we're done (see Figure 9).

That's it. We have just moved information from our spreadsheet into our memo, quickly, easily, and without entering one single command—we've done it entirely by pointing at things with the mouse. If you don't think this is a remarkably easy and powerful way to do things, try it sometime.

#### **Prints Charming**

One of the nicest things about the Lisa is that it doesn't force you to believe in the "paperless office." It acknowledges that producing paper documents is a very important part of any office system, and the Lisa's printing capabilities are astonishing. Using the Lisa applications you can create a large variety of text and graphics, and everything you see on the screen can be printed on Apple's Dot Matrix Printer. This printer. which Apple sells for less than \$700, produces quality which must be seen to be believed (so look at Figure 10!). This printing of our memo was produced on a dot matrix printer.

Almost as remarkable as the output is the way the document was created. All of the large text, boldfaced text, and italics were created without the aid of any "control characters" or special commands in the text. Instead, the text was selected with the mouse, and the special type was chosen from the Type Style menu. What's more, the large, boldfaced, and italic text were displayed on the screen in the document's window. The fancy term for this is visual fidelity, but it's more popularly known as "what you see is what you get."

#### Interoffice Memo

To: Bob Jones From: Mike Smith Date: October 27, 1984 Subject: Budget data

Bob---

Here is the budget information you requested:

	Budget	Actual
January	1254	1260
February	1354	1400
March	1463	1354
April	1580	1496
May	1706	1799
June	1843	1840
July	1990	1998
August	2149	2152
September	2321	2258

Thanks for your prompt attention to this most important matter.

#### Figure 10

These are just a few of the things you can do with text on the Lisa. You can also change fonts, choosing from 10, 12, and 15 pitch, as well as proportional spaced characters. And, of course, some of the Lisa Applications, such as Lisa-Draw and LisaGraph, help you create marvelous graphics. Adding text to these graphics is easy, and you can usually choose from the same vast array of fonts and type styles. All of this can be printed on the Dot Matrix Printer. (In case you're interested, printing a document involves choosing "Print" from the File/Print menu, then clicking "OK" in a box that comes up on the screen).

By the way, Apple's Daisy Wheel Printer also works with the Lisa. Its main advantage is that it produces fullyformed characters rather than dense dot-matrix ones. However, in order to print all the Lisa's different fonts, it requires a change of type wheels.

#### And furthermore . . .

There's an awful lot more to Lisa. For example, to get your diskette out, you have to press a button above the drive. The Lisa will then politely ask you to wait while it puts all the disk's documents away before ejecting the diskette. When you turn the Lisa off, it does the same thing: it puts everything away, then shuts off. There are lots of little touches, too, such as the way it always opens a window to the exact size and shape it was in when you last worked with it.

Lisa is a remarkably well-designed system. The care that was taken in putting the Lisa together is obvious. When some of the other systems that use a mouse and windows come along, running on computers which were really designed to handle the lesser demands of more conventional software, it will be very interesting indeed to see how they compare to Lisa.

On second thought, it probably won't be a very interesting comparison at

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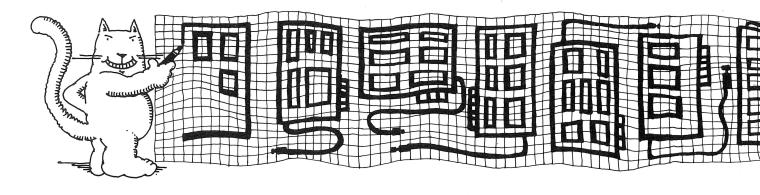
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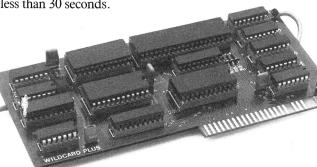
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# Your SOS Deserves a Clock

# A 30 Minute, Do-It-Yourself Project for the Apple ///

by Arthur E. ('Skip') Anderson ///

ost likely, your Apple /// is missing its clock chip. Having never had it, you've missed a great deal: lacksquare Automatic time stamping of files, the ability to use Backup /// to automatically backup/restore files by date, the ability to ask and receive the proper time and date, and (almost) never having to set the time on computer power-up. I know what you're thinking: "Why me? Why can't I have a clock chip too? How come I'm always the last guy on the block to own a clockchip? Why can't I keep up with the Joneses?" Well, now you too can own one! And best of all the Apple /// clock chip does not use any additional slots, nor will it cost you an arm and a leg.

When the Apple /// was first introduced, one of its improved features was a built-in clock. There were some problems achieving quality consistency, however, and the decision was made to kill time. Early /// purchasers got a refund check for \$50, and the clock was made to disappear. Apple folks began asking, "What clock?". If you have early versions of the manuals, you know about the reserved variables in Business BASIC and Pascal. But the clock chips have come up in reliability, and that empty slot can now be filled.

#### **Your Cost:**

The author has used his clock for more than a year now and has modified several Apple ///s. In the last month Peter Weiglin, Editor and Publisher of Apple Orchard, has modified a half-dozen Apple ///s. If he can do it, almost anybody can do it! We think that it's possible for every Apple ///er to have his own, but there is a cost (Ah ha!):

- 1. You must accept responsibility for tinkering on your Apple ///. Apple Computer Inc., Apple Orchard, and the author can not be responsible for your work. It will undoubtedly void your warranty (if you have one).
- 2. Installation will require approximately 30 minutes of your time. Futhermore, you will need some technical ability, including the ability to solder wires, a working knowledge of ICs (which way they go in), and the ability to disassemble and reassemble the bottom of your Apple ///. You may wish to ask your dealer to perform the installation.
- 3. You will need to purchase the following hardware at an approximate cost of \$10.00 (Yes folks! That's ten big ones!):
- a. One MM58167 clockchip. National Semiconductor manufactures this integrated circuit and its technical data sheet. Typical mailorder prices range from seven to ten dollars. Many parts vendors stock these chips so shop around if you like. Mailorder suppliers will often provide data sheets upon request.
- b. A battery holder that will hold two (or three) cells of the penlight or "AA" battery size, and the battery clip that a 9-



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volt battery or the holder plugs into. A two or three battery holder will work fine. They cost about \$1.00. Typical vendors are mail-order vendors and Radio Shack, etc. You need 3 cells to provide 4.5 volts for the clock when the computer is turned off. 4.5 volts is the *maximum*. If you can find only a 4-battery holder, use it, and wire a jumper in place of one of the batteries.

- c. Enough penlight batteries to fill up your battery holder, i.e. two or three "AA" cells. Approximate cost is \$1.00. These batteries ensure that the clockchip can continue to keep time. Two batteries will provide three volts, which will keep the chip operating. But the time between replacements is much longer if three batteries are used.
- d. Two lengths of wire, 20 to 24 inches long. Prefer No. 24 size wire, and different colors (e.g., red and black) for the wires. Because you will mount the battery pack next to your Apple /// speaker and run the wires down to the main circuit board, you will need about 24 inches of lead length.
- e. In order to attach the battery pack onto the Apple /// chassis (next to the speaker), you will need something sticky. Scotch (3M) brand double-sided adhesive mounting squares work great. Some people prefer to use adhesive Velcro strips for this. The mounting squares are available at stationery stores, etc., for about \$1.00.

#### **Installation:**

Thanks to Apple Computer, Inc., about 99% of the hardware installation job and 100% of the software installation is done!! (Great folks there at Apple, even if they won't admit it!)

To install your clock:

- 1. Gather together the above mentioned parts.
- 2. Gather your tools together. You will need a Phillips screwdriver, a flathead screw driver, a small soldering iron (i.e. 20-40 watt), and a small amount of 60%-tin rosin core solder. Don't use a soldering gun, and don't use acid-core solder. Also, don't use "non-corroding" paste flux.
- 3. Chances are that your battery clip came with two short wires attached. Now attach the wire leads to these short wires; red to red and black to black (or green to green, etc.) Wrap these joints with electrical tape to insulate them. With most battery clips, the positive wire is red. It's the one going to the female connector on the battery clip. Remember, the male connector on the battery is positive, which means that the female connector on the clip is positive. Check to make sure which is which.
- 4. Disconnect power cables from your Apple ///. Take the top cover off your Apple /// and remove all of the accessory cards from the slots. The red LED on the main board, next to the accessory cards, must NOT be lit. (If the LED is lit, then you forgot to disconnect the power.) Remember where each card needs to be re-installed.
- 5. Carefully remove the large bottom plate from the bottom of your Apple///. This plate has the Apple/// main circuit board mounted on it. Note where each of the external wires connect onto the main board, just in case you accidently pull a connector off!

- 6. Feed the battery-holder wires down through a hole next to the speaker. Using a screw driver, connect the negative lead. under the screw as illustrated in Figure 1. Solder the positive lead to the printed circuit board at the hole as shown in Figure
- 7. Insert the MM58167 clockchip in the IC-socket at the front of the main board as shown in Figure 1. This socket is located at board coordinate: B-3. The socket is labeled 58167. Make sure the MM58167 is inserted in the socket with the notch facing forward, like the adjacent ICs. (This insures that pin #1 is aligned properly.) Be sure that all pins are seated proper-
- 8. Re-attach the connectors to the motherboard, and replace the bottom of the Apple ///. Be sure each of the external connectors are still attached to the main board.
- 9. Insert all of your accessory cards back into their proper
- 10. Insert the batteries into the battery-holder, and attach the battery pack next to the speaker using a double-sided adhesive mounting square. Remember to put the batteries in properly.
- 11. Put the top cover back onto your Apple ///and reconnect the power cord.
- Using your System Utilities diskette, set the time. If your clock chip is working properly, then you should see the seconds ticking away in the top left corner of your screen. If not, then you must recheck your work. If your clockchip completely loses its time setting when you power down the Apple ///, then something is wrong with the battery pack or its installation.

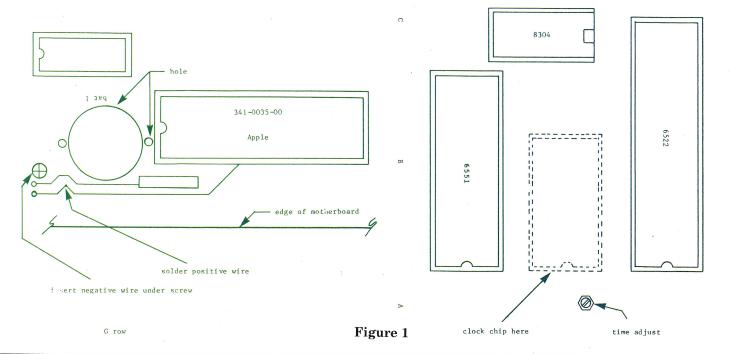
To make fine adjustments to the clock, there is a potentiometer (actually a variable capacitor) under the Apple ///'s keyboard, which you adjust with a screwdriver. If, as we found with one motherboard, the clock runs at about 10 times normal speed, get the motherboard fixed or replaced. This could be a problem until Apple acknowledges the existence of the clock; they won't fix what they claim doesn't exist!

#### A Clockchip in time, saves your mind:

The Apple /// clock chip will save you a great deal of trouble. SOS will time/date stamp your files each time you save them! You will always know when you last updated a file (or the last time you messed up a file!). If you keep regular backups of your work, you'll know which file to retrieve. That alone is worth a fortune!

Now that you have time on your hands (ha, ha, ha), you might want to play with your clock. But what software can use this clock, you say? The following is a list of some programs which are known to use the clockchip:

- 1. SOS. Automatically time & date stamps files. Any files saved through SOS (such as AppleWriter, Pascal, VisiCalc, etc.) automatically enjoy this benefit! I have yet to find a program that didn't enjoy this benefit! Also you can make the direct SOS calls: GET TIME and SET TIME.
- 2. Apple /// Pascal. You can use the Pascal filer to set and read the time and date. You can use the procedures: DATE(D), TIMEOFDAY(T), CLOCKINFO(...), and SET-



TIME(...). Information is on Page 50 of Volume 2, Apple Pascal Programmer's Manual . . . at least the edition I have.

- 3. Apple/// Business BASIC. You may run the timeset program. The reserved variables DATE\$ and TIME\$ are available even though they are not mentioned in the later editions of the manuals!!
- 4. Apple/// COBOL. You can use the COBOL utility "date". The compiler time stamps the listing.
- 5. Softcard /// (CP/M card). You can use the time utility to set and read the internal Apple ///clock.
- 6. Backup ///. This fine utility will reference the clockchip as the date and time that the backup was taken. Furthermore, since SOS now time stamps your files, you may backup/ restore files by date/time!
- 7. AppleWriter ///. You may set the date/time using the SOS commands menu cntrl-O.
- 8. Apple ///Utilities. This program allows you to set the date/time. The screen will also contain the current time.
- 9. The IAC's CP/M SOS Textmover. The current time is contained on the screen.
- 10. Volition System's Modula-2. Support of Applestuff unit and all Pascal calls relating to time.

#### Fun Projects for the Hardcore:

For those of you with an uncontrollable desire to play with the clock chip, I have three project suggestions. However, the three suggestions are not trivial!

It has been published that the Apple ///'s A/D converter has an analog switch, or multiplexer, on its input. This multiplexer allows selection of one of the eight inputs: the four different joystick inputs, a ground reference, a 2.4 volt reference, an unused input, and the clockchip battery. It would therefore be possible to examine and report the clock's battery condition from a program. See references 1 and 3 for further reading.

Your clockchip is rumored to have an output that drives pin #4 on your color port connector. The Apple /// Owner's Guide, page 132, calls this PDI. Nothing more is said. (Clever, huh?) The MM58167 has a Power Down Interrupt mode (described by the data sheet as a 'standby interrupt'). This output allows the clockchip to set off an alarm (i.e. pin #4) at a predetermined time. One good use of this would be a wakeupduring-low-telephone-rates and send/download a message program. See reference 1 for more information.

The MM58167 clockchip has a small calibration adjustment (also adjustable from under the keyboard). This variable capacitor should be adjusted so that the clockchip and the 32KHz cystal keep accurate time. A smart program could measure the timing error and display it on the screen. Internal measurements could be made via the video field rate, the VIA timers, software timing loops, etc. See reference 1 for the circuit description.

I hope this article shares some valuable information with you, and helps you to tinker your way into an inexpensive Apple /// clock. It has been a pleasurable accessory for my Apple /// and I hope you enjoy it as much as I have.

#### References:

- 1. National Semiconductor's MM58167 Data sheet. Dated July 9,1979. About 6 pages long, including pinouts, timing diagrams, and circuit examples.
- 2. "It's /// O'clock and All's Well", by John Jeppson, page 69, Softalk, November 1982.
- 3. "Hot Rod ///, Start Your Engines!", by George Oetzel, page 90, Softalk, August 1983.



# Apple's new Monitor II. A sight for sore eyes.

If you've been using a TV as a monitor, perhaps you can get a friend to read this for you:

Apple's brand new Monitor II will improve your vision.

It features all the latest ergonomic improvements in monitor technology.

For example:

Studies have shown that the leading cause of eye fatigue for computer users is lack of contrast between the displayed characters and their background.

So we designed the Monitor II around a high contrast green phosphor CRT that provides an extremely dark background. That means you can read text at a lower brightness. And that means you can be more productive — working longer and more comfortably.

Toward that same end, we also gave Monitor II a tilt screen. So you can angle it perfectly for your working position, without scooting your chair around or sitting on phone books.

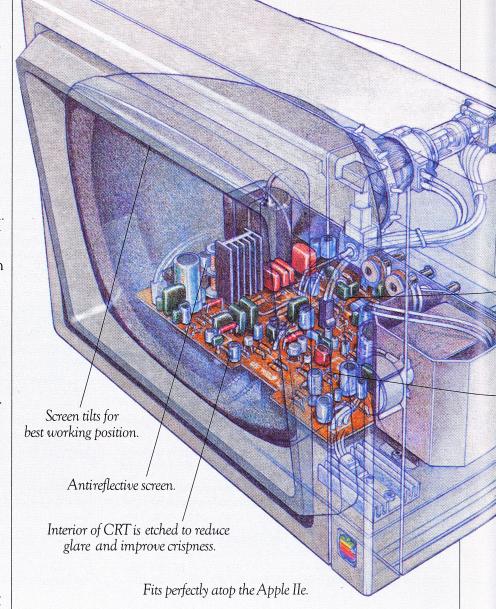
And we made that screen antireflective to reduce glare from ambient light.

Monitor II also features a high bandwidth video amplifier and a high tolerance linearity circuit. The former keeps characters from smearing on the screen and eliminates the annoying "ghosts" left by a fast moving cursor. The latter keeps characters crisp, legible and prevents "keystoning" right up to the edges of the display. Both add up to superior display of 80-column text and extremely

accurate graphics.

Designed as the perfect system partner for the Apple\* Ile Personal Computer, Monitor II requires no monitor stand. It's a perfect fit, aesthetically as well as technically. So it's pleasing to the eye even when it's turned off. See for yourself.

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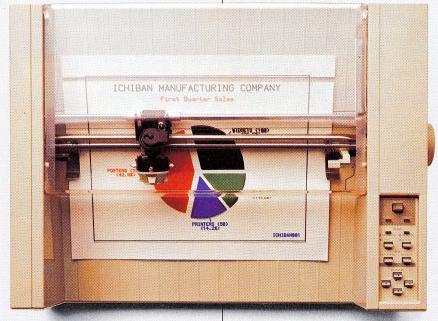
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High bandwidth

video amplifier.



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your particular kind of Apple. So you can get up and coloring right away.

Apple also offers a complete selection of 24 different pen packages — so you can choose whatever colors you need in a variety of widths for a variety of applications and media types.

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Carry-In Service is ideal for anyone who needs to know ahead of time the cost of maintenance for their system.

So check out the details — you'll find it's the lowest cost health plan an Apple can have.

Apple Computer Inc., 20525 Mariani Ave., Cupertino, Calif. 95014. For the authorized dealer nearest you, call (800) 538-9696. © 1983 Apple Computer Inc.

## The Videx Ultraterm

by Neil D. Lipson, P.E.

hen someone told me that Videx was coming out with a new card, I wondered what else they could do to surpass the Videoterm. Well, was I in for a surprise. The Ultraterm has all the features of the old Videoterm, and has many other features as well.

These features include the following:

- 1. 24-line by 80-column display
- 2. 24-line by 96-column display
- 3. 32-line by 128-column display
- 4. 24-line by 132-column display
- 5. 48-line by 80-column display
- 6. Videoterm emulation of 24-line by 80-column operation
- 7. Normal/High-resolution character set
- 8. Normal/Inverse video
- 9. Highlight/lowlight characters
- 10. Stable, flicker-free display with fast hardware scrol-
- 11. Displays all 96 ASCII characters with true descenders on lower-case characters.
- 12. 15-character line-drawing set as part of standard char-
- 13. 7-character block graphics font as part of standard character set
- 14. 7 by 9 dot character font
- 15. Operates in any peripheral slot except Slot 0
- 16. Can be used in the Apple IIe with extended memory card.

One of the best features of the card was the fantastic manual provided. To call it awesome is an understatement (do I sound like a Valley Girl?). (Schuylkill Valley.—PCW.) Everything is covered. If you still have questions after reading this manual, then go back and re-read it. It appears that very little or nothing is left out. My compliments to Videx on producing one of the best manuals that I have ever seen. There are special sections on checkout and troubleshooting, and the manual is beautifully typeset. There is a trend now towards these high quality manuals and I am thankful for it.

#### Video Monitor Selection

The most important aspect of using this card to the fullest is to have the correct monitor. I personally have the NEC JB-1201M Green, but it has a fast phospor. I had a problem, however, as in the interlace modes of some of the displays, I got vibrations from the screen. The card draws half of the dots on the character, then quickly draws the other half, and then continues to alternate. If you have a fast monitor, you will see this alternation. It wasn't intolerable, but could be a problem for some people. If you want the correct monitor for this card, look at the Amdek 300A. It has a slow phospor, and works perfectly with the card. Better yet, check out monitors at your dealer. My fear was that a monitor with a slow phosphor would have "ghosts" when playing games, being that the display changes rapidly. However, when I tried it out with the Amdek 300A, I found very few problems. It appears that this is the monitor of choice in this situation.

Believe it or not, they even have a special 160 character mode, but you have to adjust most monitors to reduce the horizontal width to actually see all the characters. Also, the monitor should be 15 MHz or higher for most of the above applications. I don't think many people will use the 160 character mode, but you never know.

#### Installation

I questioned having a section here on installation, as it is so easy, but I will tell you anyway. You plug the card into Slot 3, one of the video cords (the male) into the computer, and plug your monitor into the female cord. It's that simple. The softswitch is built into the card. I wondered how the card senses

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Videx' new PSIO Dual Function Interface Card gives you a whole new world of communication... with a whole new ease of operation.

The PSIO allows you to use a printer (parallel output) and a modem (serial I/O port) simultaneously, through use of just one card! But best of all, the PSIO makes communicating through either method worlds easier than it's ever been before.

The PSIO lets you choose from among an unmatched range of software-selectable options, including variable baud rate selection, form width, form length, auto linefeed, linefeed mask, Xon/Xoff protocol, lowercase masking, shift wire mod support, duplex mode, parity, data format, video echo mode and a slot echo mode.

**PSIO** can also open up new worlds for graphics, since it can reproduce your picture on any graphics printer. Rotate your picture, enlarge it, change it as you wish.

Once you've chosen your options, the PSIO's highly sophisticated NOVRAM (non-volatile RAM) will remember and perma-. nently save them. That means you won't have to give the same configurations over and over again ... your PSIO will do it for you. And if you want to change those configurations, you can do it through software instead of through the confusing array of switches that other cards use.

The PSIO will work with any printer/modem you now happen to own...and it will work with any printer/modem you happen to purchase in the future. Adaptable? Definitely!

The PSIO is completely compatible with BASIC, Pascal and CP/M® systems.

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See us at Trail '83



Circle HelpCard No. 69

which video is on, but somehow it does. Changing it from one computer to another is a breeze. This is a far cry from the old Videx softswitch. Remember, Videx was the first to have the 80 column card, and now they are the first to have the 132 column card. From everything I have read, their service is second to none. A top notch company in every respect.

#### **Ultraterm Commands**

Here is a summary of some of the commands available on the card:

- 1. Control-A Uppercase/lowercase toggle
- 2. Control-K Generates the [character
- 3. Control-S Pause
- 4. Control-G Bell
- 5. Control-H Moves cursor back on space
- 6. Control-J Line feed
- 7. Control-K Output command for clear the display from cursor
- 8. Control-L Clears the whole screen
- 9. Control-M Carriage Return
- 10. Control-N Sets display attribute set
- 11. Control-O Alternate attributes command
- 12. Control-R Raw Mode-disables special commands
- 13. Control-U Sets normal Apple 40 column mode
- 14. Control-V has nine functions listed below:
  - Apple 40 column
  - 1 80x24 video mode
  - 2 96-column by 24-line display mode
  - 3 160-column by 24-line mode
  - 4 80-column by 24-line interlaced characters
  - 5 sets the 80 by 32 mode with interlace
  - 6 sets the 80 by 48 more with interlace
  - 7 sets the 132 by 24 mode with interlace
  - 8 sets the 128 by 32 mode with interlace
- 15. Control-W Lead in character for video attribute
- highlight alternate char. set inverse video
  - 6 alternate char. set inverse video lowlight
  - highlight alternate char. set normal video
  - alternate char. set lowlight normal video
  - highlight 3 standard char. set inverse video
  - 2 standard char. set inverse video lowlight
  - standard char. set normal video highlight
  - standard char. set normal video lowlight
- 16. Control-Y Move the cursor to upper left-hand corner of
- 17. Control-Z Lead in for control-character display com-

There are many more commands, too numerous to go into, but the manual explains each in depth.

#### **Preboots**

Videx is preparing some special preboots for some software packages such as VisiCalc, WordStar and AppleWriter II.

#### Highlight and Lowlight

This is probably one of the most dramatic features of the card. The Ultraterm comes with an amazing demo disk which shows just about every feature. One of the features shows various letters, graphs, and data all on the same screen. If I didn't know better, I'd think I was looking at a demonstration of Lisa. The resolution seems about the same. The VisiCalc demo made the spreadsheet much more readable, and of course the extra columns allow you to see more information.

#### **Graphic Modes**

The special graphics characters are covered in depth in the Appendix in the back of the manual. The graphics options seem the same as the old Videoterm, so there are no new developments here. However, the new template editor works great with the card, so you can do some pretty fancy things with this card that are not available with other cards.

#### **Character Fonts**

I will not go into a great deal of depth on the various character fonts for this card, as there is so much you can do. We'll do a separate article specifically on this point. Videx has gone to a great deal of trouble generating and using various character fonts which include English, German, French, Italian, Swedish, and Spanish. In fact, one friend of mine has developed a fairly exotic Hebrew and Yiddish character font and has routines to print to various printers in that mode. There is no limit to what you can do in life, and this is just one small example.

#### **General Comments**

One very nice feature is that there is no flicker. This is apparent especially in using word processors and large spreadsheets. The card works with the Franklin perfectly, and even works with AceCalc from the limited uses that I have tried. Scrolling is smooth and fluid.

There is a special section on the CRTC Registers of the card. Even complete listings of the firmware are included in the Appendix of the manual. You could, if you wanted, modify the firmware and re-burn the EPROMS. Comprehensive schematic diagrams are also included with an in-depth section on theory of operation.

There are several interesting jumper and connector jumper blocks that are worth mentioning.

- Selects standard Apple signal or internal IOSEL signal. This allows use in the Apple IIe.
- Selects standard or alternate char. set J2
- J3 Video Output Connector
- J4 Video Waveform select - square wave or triangu-
- Selects normal or inverted video output signal J5
- Provides composite Sync. Video for special pro-J6 cessing boards

Other than the comments on the type of monitor to use, I found no critical aspects of the card in the least. It is well designed, and the manual is a work of art. Keep up the good work, Videx!

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## Mastering the Mountain of Documents

## Microcomputers and Litigation Support

by Clifford Franklin Shnier, B.A. L.L.B.

Attorney: Toronto, Canada

ttorneys, it is said, can make good use of microcomputers. But somehow, computers always get lumped under "Law Office Management" at Bar Convention and continuing legal education functions. And every lawyer has seen ads telling you how a computer system will "leave you with more time to practice law" — as though the two were mutually exclusive.

It is small wonder then that most lawyers think of computers as merely devices for the administrative and bookkeeping end of things; stuff for office managers and managing partners but of no real relevance to the actual practice of law. Especially to litigation types. Not for them that funny green screen and chattering printer! They're involved in the "real" practice of law!

The irony is that the microcomputer is ideally suited to litigation. It can make the conduct of a complicated lawsuit from initial retainer to final appeal more efficient, more certain, and more enjoyable.

In a complicated commercial litigation matter, a lawyer's "file" may consist of a growing mass of thousands of documents filling dozens of bulging expansion folders, boxes, filing drawers, cabinets, and even rooms as the discovery process proceeds. The lawyer needs a system to gain easy access to all of the relevant information and evidence within that mass to assist him at every major step of an action: the preparation of pleadings; preparation of the list of your documentation for disclosure; reviewing, cataloguing and digesting the other side's documents, preparing the client for deposition, preparing to examine the other party in deposition, drafting and answering interrogatories, document exhibit management and retrieval during and after the depositions; transcript review; and most importantly, preparation for trial.

#### What "Litigation Support" Means

A system to help manage all of these documents, to assist the lawyer through all of those steps is called Litigation Support. What is meant by this expression?

"Classically defined, it refers simply to the process of preparing a case for trial. The techniques and goals are well known. First, become familiar with the location, content, and relevance of every document in the case. Second, do so better than the adversary - and win.

"Until the advent of truly large-scale cases, litigation support was accomplished by the lawyer himself diligently perusing the documents and formulating his case. When larger lawsuits became more frequent, litigation support was a phrase known to connote a room full of law students, or even newly admitted lawyers, feverishly all annotating 3 x 5 cards. Later, as the computer revolution swept all industries, it was a natural application of the inherent processing speed of computing machinery that the 3 x 5 cards would be "computerized". That word being synonymous with the process of loading all of the contents of the 3 x 5 cards into the computer's memory, and then using information search and retrieval techniques to locate the pertinent documents."1

Legal journals and periodicals nowadays frequently carry articles and advertising about litigation support. The March 1, 1982 issue of the National Law Journal contained nine ads as well as an article about computerized litigation support systems. The issue four weeks earlier had the same number of ads and three separate articles on the subject.

The U.S. would be a natural spawning ground for computerized litigation support systems. The well-publicized antitrust action, both those publicly and those privately prosecuted, can easily involve hundreds of thousands of letters, memos, agreements, telegrams, price lists and, as the case proceeds, hundreds of interrogatories, answers, depositions and exhibits.

It is no coincidence that litigation support became computerized around the same time that IBM was defending itself, in numerous private antitrust actions and in a U.S. government prosecution. In all these cases the defendants' attorneys were assisted by very sophisticated computerized information retrieval systems, even to the point of having Monday's trial testimony cross-checked by the computer so that on Tuesday, for the purpose of cross-examination a defense attorney would have a print out of absolutely everything the witness in the box had ever said previously on the subjects covered in Monday's testimony.

The U.S. prosecuting attorneys apparently had similar assistance (NJL March 1/82, p.21, cols. 3 & 4). One wonders whether they used IBM computers.

In a similar vein, in its advertisement for a litigation support system, the Control Data Corp. of Minneapolis states that its product got its start with its "own litigation involving millions of documents". This was in its own private antitrust suit against IBM. 2

#### Size of Case Suited to the Computer

Many of the advertisements for computerized litigation support systems seem geared to the real mega-cases, offering consultants, tailored programs, and mainframe computer usage for document populations numbering in the hundreds of thousands. These ads may foster the impression that only cases of that size should require or be suited to computerized assistance.

With the advent of the microcomputer over the past few years and the proliferation of computer software now on the market, computerized litigation support is now realistic and practical for the moderate volume case involving merely hundreds or thousands of documents. One commentator writing as long ago as 1976 (ancient by computer industry standards) recognized that computerized systems would no longer be exclusive to the antitrust blockbusters.

"Use of a computer should not be rejected simply because a case is a tax or patent liability case rather than an antitrust case or simply because documentary evidence consists of only 6,000 rather than 600,000 documents. A case involving a small volume of documents may justify a relatively simple computer-based litigation support system. The system would still offer capabilities for accessing the documents significantly superior to any manual procedures which might be utilized."3

#### No More Fright and Panic

Computerized Litigation Support, as many lawyers have found, is the area in which the way they do their work can be most dramatically and directly affected. Computerized bookkeeping greatly assists billing and management; word processing is invaluable for redrafting and editing; legal research by computer is a real time saver. But with or without computers the commercial litigation lawyer spends not that much time in any of those three areas. His work is mostly dealing with facts, and facts come in the form of, or are reduced to, writing. He has to gather, organize, correlate. compare, fill in gaps among, ask the right questions about, analyze, and determine how best to present, the facts. Of all the four above uses of computers in a law practice management of documents for litigation has been called "the most critical application".4

The problem that computerized Litigation Support addresses has been well stated in one concise paragraph by another lawyer:

"How many times in the past few years, as major litigation has increased, have you encountered that tenseness, helplessness and, ultimately, pure fright or outright panic as you began to realize that the mass of evidence that was piling up by reason of pretrial procedures had reached the point where not only your personal ability to recall was exhausted, but the systems you had devised were either hopelessly inadequate or had reached a point where they also were out of control? The feeling comes when you project yourself into the actual trial of the case and wonder how to have the benefit of your extensive pretrial discovery at your fingertips when needed.<sup>5</sup>

Some of the benefits that are derived from a computer on your team in litigation are that with it you can:

- Assemble your facts on any point;
- List all documents sent or received by a certain individual;
- Obtain a full chronological listing of documents, or a certain group pertaining to a specific item;
- Make instant comparisons and correlations as new information and documents are received;
- "Track" a document as it becomes a discovery exhibit, undertaking or interrogatory answer, or trial exhi-
- Find instantly that letter or memo from Mr. "X" to Mr. "Y" dealing with subject "Z" written around a certain time;
- "Get a handle" on transcribed testimony by summarizing it onto computer memory.

For the medium-sized case, one set of hardware and software that meets the requirements is the Apple II Plus and a data base; my choice was Visidex. Most readers need no introduction to the Apple.

Visidex is a program first distributed in 1981 by Visicorp; its author is a programmer named Peter Jennings. Visicorp's literature describes the program as an "electronic index card". At the back of the program booklet, there is a list of 101 ways in which it might be used: "A reader indexes his periodicals with short abstracts"; "A dentist keeps his client's names in mailing label form"; "A dating service keeps crossreferenced files of applicants and their preferences"; etc. While they are imaginative, none of these 101 suggested possible usages covers the use of the program for litigation suport, probably because litigation lawyers and computer programmers usually have nothing to do with one another. (Would that it were so!—PCW.)

The configuration that will provide everything needed is the Apple II Plus itself, one or (preferably) two disk drives, a video monitor, and a matrix printer. The software will be an additional couple of hundred dollars. The total investment would be in the low to mid four-figure bracket, which should be recouped in the time saved and the results achieved on the first two or three matters to which the system is applied.

#### Conversion: benefits and burdens

It is often assumed that a computer will permit you to cut back on personnel and thereby save salary expense; in fact, one sole practitioner attorney was quoted in an article as saying his computer was "a reserve of five associates", there when needed, for the occasional big case. Frankly, even with-

out the computer, this lone wolf probably would never have hired one, let alone five associates. He simply would have worked extra evenings and weekends during critical times on a big case.

The way in which computerized litigation support will affect the lawyer is highly individual and depends mostly on what was in place before the computer came along. In some cases it *might* result in savings through associate lawyer and paralegal staff reductions (or less hiring), but in these days of high unemployment among lawyers, that is a dubious selling point.

As we have seen, it will permit the attorney who prefers to work solo to continue that way, only more efficiently and in less time. In other words, his productivity per hour will increase.

What about the lawyer who has legally-trained staff in the form of associates, paralegal clerks, or students? If he was using them in a manual litigation support role ("feverishly annotating 3 x 5 cards") before, then the arrival of the computer will not change the allocation of the workload, it will only change the nature (more interesting) and quality (better) of the work that gets done.

The lawyer who will benefit most dramatically is the one who, while having access to qualified assistants in his firm, rarely uses them for the purpose of helping manage a large documents case. Aside from suffering from the common lawyers' delusion that "no one, (including other lawyers), is as smart as me", this lawyer also fears that the system (if any) that he uses to manage large documents cases is so riddled with peculiarities that someone else fumbling around with it will cause a disaster.

Before the arrival of the computer, this "non-delegating" type of lawyer may have had no true manual system at all to structure the work that had to be done with that mass of paper. He would look through the pile and make a few desultory notes, which became both fewer and more desultory as the hours passed. He might try annotating some index cards, or using colour-coded tabs (actually, not a bad system for cases of less than 150 documents and 10 keywords). Eventually, he would give up, leaving the job half done and the facts of his case, in his mind, only imperfectly understood; while rationalizing that he would have to go through it all again when the time came for the next major step in the case. And, in the meantime, he had other things to do.

His self-inflicted wound is, of course, caused mainly by failure to delegate. Having chosen to be indispensible, he gets impaled on the other horn of being too busy to do a proper manual job of annotating and indexing by himself.

The computer will not permit him to get away with this. Having invested in it, he cannot neglect it. An unused computer, no matter how inexpensive, is still far more guiltinducing than unused index cards. Someone has to feed the computer. The documents in a big case have to be reviewed, summarized, and entered into the computer. The non-delegating lawyer who uses the "no-system" system will quickly find this a real burden. He will have to delegate or else accept the work load himself.

Because the computer and the program provide the lawyer with a system that can be grasped by reading the program manual, it imposes on him a system that can readily be understood by more than one person. It creates and enforces a common language among the lawyer and his associates, making each of them more able to pick up and understand each other's work. It makes them both think on the same wavelength. The computer itself overcomes many of the problems that made the lawyer so loath to delegate.

At the beginning of any case, the computer forces the lawyer or his associates to spend more time and to pay closer attention to a pile of documentation than they might have under the "no-system" system.

The payoff comes later, in the amazing ease with which later additions to the document population can be digested and analyzed, in the speed with which you can prepare for oral examinations for discovery, or written interrogatories with the secure certainty of knowing you have just reviewed every document pertaining to the leaky roof, with the peace of mind that comes from knowing that every piece of paper pertaining to "leaky roof - cost of repair" is instantly available, and with the happy knowledge that your trial preparation will take a fraction of the time it otherwise would.

Computerized litigation support does not eliminate paper handling. It eliminates redundant paper handling. With its instant recall, it greatly reduces the usual several hours of "start up" time that turning to a monster file always consumes before anything further actually gets accomplished on it. Another benefit is the sheer physical effort it saves in hefting heavy files files around. Magnetic diskettes are very light and portable; just keep them away from magnets, heat, and errant liquids.

The kind of cases that could benefit from computerized litigation systems are widely varied having in common only their volume and complexity. They can involve construction deficiencies, product liability, antitrust matters, medical malpractice, shareholder battles, taxation, anything.

In entering your documents and information onto the computer memory to create your data base, there are two different approaches: "full text" and "abstract". In "full text" the entire contents of a document are transcribed verbatim into the computer memory. Additional search terms may be added to ensure that the memo about the "garden wall" known more commonly as the "retaining wall" is indexed under the latter though that name does not appear in the body of the text. The drawbacks to the "full text" approach are several:

- keyboard input is lengthy and tedious, and will tie up huge amounts of your secretary's time;
- computer memory space gets used up more quickly;
- unnecessary and irrelevant material is input, leading to some spurious search results. For example, a search for all documents in a construction deficiency case dealing with "ROOF" reveals the following passage from the Board of Directors Minutes:

"... Mr. Jones moved that peanut butter no longer be served as a refreshment at board meetings because it sticks to the \*roof\* of your mouth . . ."

The other approach is the "abstract", in which only summaries of documents are entered. This avoids the problems listed above but it requires a professional legal mind to prepare those summaries, because you have to be sure that the summary is accurate, complete, and has the proper "keywords" noted in it.

This "burden" of the abstract approach of summarizing all documentation is also a benefit, because it means that right from the start someone—whoever is doing the summarizing—is also doing some analyzing and both his brain and the computer's are arriving at an early understanding of what the case is all about.

#### The Summary Format

Summaries of documents in the "abstract" approach should conform to a standardized format, called a template. In designing that form, you can prepare a list of what it is that in general you would need to know about every document. Usually this would include the following:

A. Type of document? (Letter, invoice, estimate, telegram, etc. Date?

Who is it *from*?

Who is it to?

B. Location in your file (e.g. folder no. 14).

*Number* if any assigned to it (our production #37).

Source (us, them, or outsider).

Exhibit numbers by which it has been referred to on oral depositions or as undertaking replies.

Whether or not you will be producing it or claiming privilege.

C. Subjects covered

Factual information contained in it.

Comments you may have about it that you wish to record.

You can design a template to cover these headings.

Documents are not your only source of information; you should in addition, have a reliable means of recalling where in your file you made a memo of a conversation with your client concerning the subject of his lost pension benefits in a wrongful dismissal action. Certain other types of lawyer's correspondence may also be necessary for your litigation support data base; for example, a letter from the opposite solicitor telling you, "according to my client's experts, your client built the retaining wall with insufficient foundations and reinforcement".

There is also no reason the pleadings should not go into the data base. If you want to find out where in a 25-page complaint, the retaining wall is referred to and exactly what is pleaded about it, you should be able to call it up instantly.

Lastly, you may have lengthy expert reports (engineering, medical, accountant's, etc.), and it would be helpful to know exactly what is in them and where; again, stored in a manner that your access to the section of the engineer's report dealing with the retaining wall will be instantaneous.

In these three additional sources of factual information; file memos of conversations or meetings, pleadings, and expert reports, different templates can be designed.

A most dramatic and easy use of the computer is for indexing deposition transcripts. Usually, just by highlighting a transcript and a few marginal notations, you can create a coherent summary of it that your secretary can enter straight into the computer (using a preformatted template). Later, when you want the question numbers where the deponent testified about subject "X", you will have it in seconds, not after annoying minutes of frantically thumbing through pages and pages of testimony.

#### The Search: by Keywords, or Otherwise

The essential element of this whole system is the keyword search. When you summarize a document, or a portion of an expert report, or a transcript, you indicate to the computer which words in that summary are to be designated as "keywords". You can even designate keywords that do not actually appear in the body of the text of the summary.

In a case involving various construction complaints, you will have keywords such as: roof, plumbing, paving, masonry, estimates, invoices, costs, repairs, our engineer, their engineer, our discovery deponent, their discovery deponent, plans, specifications, by-laws, codes, etc. Once your data entry is complete, you will be able to find quickly and easily such things as:

- what our engineer said re the plumbing violating the codes:
- what their discovery deponent admitted were the applicable plans and specifications;
- everything we have on paving;
- *costs* to date expended on the *roof*.

And, even if you did not remember to designate a certain word as a keyword, there is a search method that will find it in any of your summaries. It takes a few seconds longer, because the computer has to do a "literal" search.

Aside from helping you find quickly what it is you are searching for in your data, there are other time-saving features. You can have each document summary printed out in date order. Moreover, you can have the computer print only the first several lines of each document summary: the date, the type of document, who it is from, whom it is to, etc. but suppressing the summary itself. This is useful in jurisdictions that require disclosure of the documents that you have by listing them. It creates the list without letting the other side have your work product as well.

#### How You Ultimately Benefit: Some Examples

Up to this point, the actual expended effort in reviewing and summarizing, with some pretty intense concentration is probably greater than it would be under the "no-system" system, but, once that work has been done, it will not have to be done again. Your work product is preserved electronically ready for instant memory access when your own human memory, several weeks or months later, has grown cold on these facts. The computerized litigation support approach minimizes redundant paper handling and greatly reduces the time that it takes to get your head back into a big file.

"That's why the computer saves money. It saves money not because it does the lawyer's work for him, but because it receives and preserves the lawyers' work product. The computer keeps the lawyers' work product instantaneously available, and the computer retrieves the lawyers' work product exactly the way he wanted it."6

Discovery of the other side's documents is rendered easier because you have a framework within which they can be dealt with. Your summarizing of them, comparing them to the information you already have and your preparation for oral examination for discovery, can be wrapped up as one oper-

In preparing requests for admission or for oral examination, you have by this time a system that enables you to focus and structure your preparation logically and concisely. You want the deponent's admission that all letters sent or copied to him were in fact received by him. The computer will list all such letters in a minute.

You recall a minute of a 1976 meeting where the plaintiff, a contractor admitted he was having trouble getting sufficient manpower on your client's construction site. Now, he is suing your client, alleging loss due to delay. To cut down that delay claim you want to show instances where it was his problem. You call up the memory of the summary of that Minute with a few keywords. You see that persons "A", "B" and "C" were there as well as "D", the plaintiff, who is the deponent on an examination you will conduct. You see as well that the deponent is recorded as having admitted a manpower problem. The computer has retrieved for you that document in the space of thirty seconds. Instead of wasting vital time and energy trying to find it, you can now use that energy more creatively formulating questions that will pin the deponent with the admission contained in the Minute.

Here is another example: you act for a condominium homeowners' association suing the builder for various deficiencies, including the fact that the walls seem paper thin and afford little privacy. The builder's lawyer sends you an acoustical engineer's report that concludes that the sound transmission ratings comply with the local codes. It has been two or three months since you were active on the file due to vacations, other trials, etc. and your own memory on the point is vague. You have to advise your client that this information has come in from the other side, but more than that, you have to say something about it. What do you do? With the Apple and Visidex, you sit down at the terminal, load the diskette containing this case, and search "SOUND & OUR ENGINEERS & CODES" and find the following:

Type: Engineering Report Date: July 31, 1981

From: ABC Sound Specialists

To: Tranquil Valley Homeowners Association

Location: Binder 3, pages 92-114

Number:

Source: "OUR ENGINEERS" Produce? No, privileged Length: 5 sections

Part Summarized Here: Section 3

Facts: Test readings to show whether it complies with local \*CODES\* show mixed results. However, if original plans and specifications had been followed, \*SOUND\* transmission would be greatly reduced. Local \*CODES\* are minimal requirements in any event.

Comments: . . . .

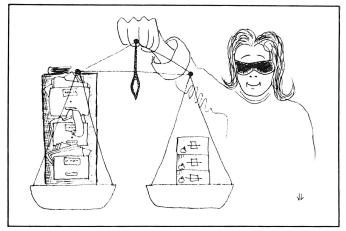
A few minutes at the terminal has shown you that the other side's "deadly" engineering report does not sink your ship after all. The computer has helped you determine that your theory of liability is noncompliance with the plans and specifications, not the codes. You can prepare your interrogatories, requests for admission, and your oral questioning accordingly.

If you had had to scramble through an unindexed file manually, the effort would take hours. If you had an index card system, it would have to be most extraordinary to give you "sound", "our engineers" and "codes" on one search. You would undoubtedly have had to check several documents and flip through numerous cards. That would have taken time too. However, with the computer, that time and energy has been saved. Your client is not going to be paying for you to wallow around in paper. The computer does the wallowing for you, a lot faster and a lot more effectively. Your time is left to analyze, compare, and create, moving the case forward all the more quickly to a satisfactory conclusion, and with a lot less pain and tedium for you along the way.

#### The Next Step

The foregoing assumes using the setup in the confines of your office, but why stop there? While it is certainly possible to assemble hard copy printouts in a fashion that is readily useable in court, it would be better still to have the computer right there with your assistant operating it. As the witness for the other side is testifying, your screen is flashing what he said about those subjects on previous occasions. As your own evidence is going in, the Apple records which of your crucial documents is admitted and marked as an exhibit; when you refer later in argument to the document you have always known as the "supplementary agreement", a few keys punched at the terminal will tell you that, to the court, it is Exhibit 14.

Provided that it is unobtrusive (don't bring the printer) and you can arrange a convenient power source, there should be no reason not to have it at your counsel table, although you should clear this with the Trial Judge first. If you think that it will appear to the judge and jury that you have an advantage over the other side, remember that this is counterbalanced by the fact that, you do, indeed.



#### Notes

- 1. Computers in Litigation Support, William E. Cwiklo, ed. Petrocelli Publishing Co. 1979, New York, p.1
- 2. For interesting reading on IBM's legal wrangles throughout the 1970's and in particular a prosecution by the Telex corporation of Tulsa, see Chapter 5 of Joseph C. Goulden's book, The Million Dollar Lawyers, 1977. Putnam. New York.
- 3. Olson, S.J. and Goodrich, Litigation Support Systems Present Status and Future Use in Computers in Ligitation Support, op. cit., pp. 153-154.
- 4. Arthur, R.S. The Computer and the Practice of Law: Litigation Support, in Computers in Litigation Support, op. cit., p.295 at 298.
- 5. Sidney, R.H., "A Trial Lawyer's Solution to an Age-Old Problem Using A High-Speed Idiot with a Long Memory" in Computer in Litigation Support, op. cit., p.185.
- 6. Sanders, W.H. "Employment of Litigation Support Systems in Preparation of a Products Liability Case", in Computers in Litigation Support, op. cit., p.215 at p.221.

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## Computer Software + Copyrights, Patents, and Tradesecrets = Confusion

by Martha R. Gore

f someone asked you what successful computer programs have in common, would you know? The answer is that in most cases they are protected by either a copyright, patent, trade secret or a licensing agreement.

Why should that be important to the average Apple user, or for that matter, any other computer user? The reason is that every time a user copies or reproduces a program without the owner's permission, a law is being broken. In fact, one might say that, sometimes inadvertently, there's a whole lot of stealing going on. And oftentimes it's being done by people who ordinarily would never consider taking anything that belonged to someone else. This happens because it is not always fully understood that computer programs, unless in the public domain, are protected by special laws passed by the Congress of the United States to protect the financial interest of the creators of those programs.

Copyrights, patents, trade secrets and licensing agreements are all legal terminology for the ways a writer of software can protect and realize a profit from the time and effort put into developing and writing computer programs.

That all sounds quite simple, yet the determination of which programs can be protected by these laws provide a healthy income for patent lawyers and a continuous stream of opinions from judges. Sometimes the result is more questions than answers.

One of the chief problems is that each program has unique elements which must be taken into account when considering laws which apply to software. Each program must be considered on its own merit and often there is no precedent on which to base an opinion.

This is partly because software has been hitting the market in abundance since personal and small office computers became affordable. The more users, the more demand for programs.

Once, these programs were written by users for their own computer operations. Now programs are being written which can be run on any one of a number of computers. The legal system was not prepared for this deluge of programs and problems. I takes time to find solutions to problems which have developed from the complexities of programs written including some language used in prior programs. Who has legal rights to such programs and exactly what can be covered under the various laws continues to keep the courts in a quandry.

It does not make the situation any clearer when lawyers themselves can't agree about reproduction limitations and exactly what constitutes copyright, patent and trade secret infringement.

Perhaps the best advice to both users and writers of software is to avoid legal problems by understanding the laws before trouble ensues. Once into a legal entanglement, there can be years of aggravation and expenses which can run into thousands of dollars.

How one goes about getting that advice and when it may become necessary is what this article is all about. It is not a substitute for legal advice; that has to be provided by a lawyer who practices copyright and patent law. His/her training and experience should provide the expertise required to deal with each particular problem and its ramification.

This is not the first time an industry and individuals involved with it have faced problems of this kind. Similarities confronted by the recording industry earlier in this century helped to provide a basis for the protection of software.

Initially, copying wasn't much of a problem for record producers; the costly procedure discouraged piracy. But when transistorized tape came into the picture, something had to be done to protect legitimate producers. If the practice was not controlled, it could debilitate an entire industry.

The Sound Recording Act of 1971 was passed to try to correct the situation. It provided sanctions against anyone who duplicated sound recordings without authorization.

Like sound recordings, which were originally produced by Victrola for its own record players, computer programs were originally written for the owner or manufacturer of a specific computer. This was an expensive process, based largely on vacuum tubes. Because of the cost, it was used only by the government or by large corporations. To function properly, a special environment was maintained in which temperature and humidity could be controlled. The programs were created and therefore controlled by the manufacturer as sole user.

The changes in the computer and software industry since that time have been spectacular. Starting with the original vacuum tubes, then moving on through transistors, printed circuits and integrated circuits, it has been an on-going and exciting process. It saw the development and sometimes obsolescence of bulky plug boards, punched paper cards and tape replaced by magnetic tape, disks and semiconductor chips.

Once again, like sound recordings, the original cost of both computer and software was so expensive that protection did not seem crucial. Then the computer became less cumbersome and prices began to drop. As more and smaller computers came on the market, creating programs became a highly profitable enterprise. With the low cost of reproduction came the pirates. Some government action had to be taken to protect creators of programs.

The fact is that in the United States alone there are probably several million persons who can understand, at some level, computer languages which are part of the most widely used programs. This, along with the fact that duplication costs so little and is so easy to do, had great influence when the law was considered.

The federal government decided that some way had to be found so that creators of programs could recover costs and make money on the sale of their work. This was not magnanimous on the part of Congress; the intent was that program writers should be encouraged to produce and distribute software for the good of the economy.

So when the 1976 Copyright Law was passed, it equated computer programs with literary works which made them eligible for the same broad protection.

This law was amended in 1980 to cover and include object codes, and included a simple definition of a computer program as a "set of statements or instructions to be used directly or indirectly in a computer to bring about certain results."

What makes a work eligible to be covered by that law? The law went on to say that the basis for determining whether a work is copyrightable is that it must be an original work of authorship fixed in a tangible medium of expression. Therein lies the rub: the interpretation of that word "original."

If a work owes its origin to the author, is independently created and is not copied from other works, it can be understood to be original and copyrightable.

Not included in the category of copyrightable works are ideas, titles, names, procedures, processes, systems, methods of operations, concepts, principles or discoveries. Some of these are covered under patent and trade secret laws.

As long as the program remains in a fixed, tangible medium of expression, it can be protected by the copyright law. The electro-magnetic functioning of a machine cannot be protected by that law.

One way to understand this is to look at the way copyright affects games and game playing. One may not adapt and republish or redistribute copyrighted game rules, but the owner of the copyright has no power to prevent others from playing the game. What that means is one is always free to make a machine perform any process (in the absence of a patent) but no one can lift another's copyrighted program.

But here is where one of the most difficult problems arises. Just the way a literary writer can take a lot of words which have been used before and put them together in a new way to create a new work, so software writers can take a number of symbols, some of which have been used before, combine them in a new way, and create an original work.

With software, it is much more difficult to is determine where originality ends and reproducing and copying begins.

Even lawyers can't seem to agree on this determination.

Some feel that a program is copyrightable if it at least has a spark of originality. Even if the combination is just old stuff that has been combined in a new way, some attorneys say it is still copyrightable. It doesn't make any difference, according to this group, that elements have been used before, if something has been added to it, it is still something unique. They declare that the basic information is out there in the universe and because the creator packaged it to make the machine do something it had not done before, or made it do it in a better, more efficient way, it should be considered a new work.

Other lawyers say "No", this is a derivation of a prior work and therefore infringes on the copyright of the writer. They argue that the law defines a derivative work as a creation that is based upon pre-existing work which includes revisions, annotations, elaborations, etc.

Yet another legal argument is that the "idea-expression identity" exception provides that copyrighted language can be copied without infringing when there are a limited number of ways in which a given idea can be expressed. This is an extension of the fundamental principle that ideas cannot be protected under the Copyright Law.

When extending this to software, this means that when specific instructions, even though copyrighted, are the only and essential means of accomplishing a given task, their later use by another writer will not be considered infringement.

This has been reinforced by the courts which have indicated that copyright protection for programs cannot be used to block the use of ideas or program language previously developed by others when that use is necessary to achieve a certain results. In other words, when other languages are available, software writers are free to read copyrighted programs and use the ideas embodied in them when preparing their own

But under a patent system, where the process itself is protected, this practice is almost impossible, and difficult under trade secrecy, where the text of a program is designed not to be revealed.

Therefore, in this context, flow charts, source codes and object codes are works of authorship in which copyright subsists.

(A flow chart is a graphic representation for the definition, analysis or solution of a problem in which symbols are used to represent operations, data flow or equipment. A source code is a computer program written in any of several programming languages employed by computer programmers. An object code is the version of a program in which the source code is converted or translated into the machine language of the computer with which it is to be used.)

How then, after all this has been said, can it be determined at what point a work has been copied and at what point the program becomes an original work? By now, it should be evident that this threshold is very difficult to define. And distinguishing the old from the new is where lawsuits about copyright infringement evolve. In addition, if this was not enough, the distinction between a copyrightable program and a patented process or method of operation is not always clear.

How does copyrighting of a program take place? Technically, when the work is "fixed", embodied in a copy that is sufficiently permanent or stable to permit it to be perceived, reproduced or otherwise communicated for more than a transitory duration, it is automatically protected by the Copyright Law. So since works in computer storage may be repeatedly reproduced, they are "fixed" and are therefore, copies. Although not required by law, a copyright notice ©, date and name of the owner is placed on the work to protect the copyright.

Attorney Sam Sutton, with the firm of Cahill, Suttton, & Thomas, patent attorneys in Phoenix, AZ has compared placing a copyright notice on a program to branding a burro to claim ownership. For example, if a wild burro is running wild in the desert, and if a man was resourceful enough to capture and put his brand on it and put it in a corral, no matter how often that burro escaped or where that burro turned up, the brand would tell the world that the animal had an owner.

In the case of source language programs, the copyright notice is placed near the front of the program so that the information is on the first page of the listing. Manuals or instructions should also show the copyright. It is a declaration of the author's exclusive right to the publication, production and sale of rights to a computer program for the life of the writer and for fifty years after his/her death.

It is not necessary to register a copyright, but it makes good sense to make the effort as soon as possible or a least three months after creation. Actually, the law permits registration to take place within the first 5 years, but the sooner the better. If the writer registers a program within that time, the law allows him to collect statutory damages rather than just actual damages. In addition, attorneys' fees can be collected. The registration procedure can take some time, although the Copyright Office has been known to hurry things along if a lawsuit is impending.

Actually registering a program for copyright is a simple procedure. A complete copyright kit should be requested which includes Form TX that is used to register computer programs and operating manuals and is available free from

the Copyright Office, Library of Congress, Washington, D.C. 20559. There are also two telephone hotlines, (202) 287-8700 for information and (202) 287-9100 to order the kit or forms.

The registration fee of \$10 must be included with two of the best copies of the program listing. Some programmers include the first and last ten pages of the object code. If the program is lengthy, only the first twenty pages and the last twenty pages must be deposited. It might be wise to check with the Copyright Office for the latest requirements. It is important to understand that once a program is deposited with the Copyright Office, it is available for anyone can see it.

But that does not give anyone the right to copy the program in its entirety. If that happens, it is considered infringement and the courts allow remedies such as the recovery of full costs, reasonable attorneys' fees and under some circumstances, additional damages. Infringement can even be considered a criminal act, with a fine of not more than \$10,000 and/or imprisonment for not more than one year, if it can be proven that the copying was done willfully and for commercial advantage or gain.

Infringement only takes place when an unauthorized copy of a program is made. There is no law against making archival or backup copies, for your own use, of programs which you have purchased legally.

#### **Patents**

Patent protection may be better under certain circumstances since it gives the program owner the right not only to license and control the use of the patented device or process, but also prevents the use of this device or process when independently developed by third parties. These rights last for 17 years. Patents are designed to give inventors a shortterm, powerful monoply in devices, processes, composition of matter and designs which embody their ideas.

Because a patent gives its owner monopoly rights, the acquisition is time consuming and expensive with difficult legal hurdles to overcome. The applicant must prove that the work is useful, novel and not obvious to those familiar with the state of the art in which the patent is sought to the satisfaction of the Patent and Trademark Office, or failing that, to the Court of Customs and Patent Appeals or the U. S. Supreme Court.

If a computer program could be patented, it would become very difficult to modify, transpose or translate them. But getting a patent for a computer program which is not part of a system is presently almost impossible. Unless Congress makes changes in the law, a pure computer program is not acceptable for patent protection, but inventions using a computer program in a machine or a process can apply if the criteria demanded are met.

An application must be filed by the inventor within one year of public disclosure (which may extend from the actual sale of the invention to discussions about it with friends). It is wise to file the application for a patent as quickly as possible.

Unlike copyrights, patents are costly to draw up, obtain and defend. Attorneys suggest that \$5000 to \$30000 are fair estimates of costs involved.

#### **Trade Secrets**

Some lawyers recommend the trade secret route for protecting software. A trade secret is defined as information unknown in the market place. To keep it that way means taking many precautions. For example, before making the information available, owners often ask employees and others to sign agreements of confidentiality. In a case of a trade secret infringement lawsuit, evidence that no effort has been made to protect the software could prove damaging to the plain-

At this point in the life of a program is where a good copyright or patent attorney becomes important; someone with the expertise to lead a writer through the legal maze and to help in making the decision as to whether copyright, patent or tradesecret is the way to go. An attorney can also help in preparing licensing arrangements.

If the writer decides to use a lawyer, it behooves him to be completely honest so that a determination can be made as to the originality of the work. If elements have knowingly been taken from another program, this should be explained to the lawyer. The writer should have enough knowledge about the differences and enough expertise using the program to demonstrate that the work is a new creation. An experienced attorney will realize that the first line of defense in an infringement lawsuit is documentation availability to help prove the client's case.

Once the writer and attorney agree about the program's originality, it should be registered as quickly as possible. Registration should be keyed to the first time the program ran and worked. Once registration takes place, there is a permanent public record of the writer's claim to the creation and control of his product.

A lawyer should be consulted once again when a buyer is found for the software. The lawyer should either draw up the contract or look over a contract submitted by anyone interested in distributing the work. A contract can include the sale of all rights which gives all control of the product to the purchaser, or part of the rights can be withheld. Of course, writers have successfully marketed (sold or leased) software themselves. An iron-clad rule is never, never, never to allow one attorney to represent both parties to a contract.

But some software writers lose control of the product before it ever reaches that stage of promotion because no effort was made to protect the software. When this happens, it can go into the public domain by virtue of common usage. There are a good number of programs which once were owned exclusively, but were so poorly protected that there was no way to prove where they originated. If material is allowed to be used without permission and the writer ignores what is happening to his creation, he can expect to lose rights to it.

It can happen that on-lookers or minor participants in a project will recognize a valuable program and register the copyright as their own. When a number of people are involved, documentation is not hard to acquire. Then proving who actually owns the software can bring about a lawsuit, especially if it looks like the program is going to be a moneymaker. Having an agreement with everyone involved at any stage of program development can avoid future copyright problems.

By now it must be obvious that protecting original software is not easy because it is in machines and accessible to anyone with a little knowledge and who sees the output. It doesn't take too much effort to figure out how to make some changes, call it something new and put it on the market. Modifying a program which has been developed for one computer so that it will run on another is common practice today. There are lots of stories knocking around about new companies which have been formed by someone working on a university or corporation computer on his own time, figuring out what was in the machine, making some modification, and then going into business for himself.

#### **Piracy**

The next sore point in the industry is outright piracy of programs. There have been all kinds of estimates as to how much of this is actually taking place. Some lawyers think that the ratio is about two and one half copies stolen for each one that is purchased.

Some of this is due to the fact that ordinary people, who would never walk into a computer store and steal a program off the shelf, think nothing a making copies for friends.

Then there are, according to some producers, informal user clubs which exchange programs and account for the greatest amount of piracy. Compared to these exchange programs, thieves who copy programs to be sold at a fraction of the retail price are a lesser threat.

Whether this will be corrected by producers of software copy-protecting their programs is to be seen. The time could come when a user will be required to buy back-up or archival copies instead of simply reproducing them as is the presently accepted practice. (The evidence so far indicates that copy protection has merely extended the time required to make a copy from 90 seconds to 90 minutes or so, and the "better" schemes generate disks that don't always boot, or get in the way of the program.—PCW.)

#### Seeing a Publisher

It is not a common occurrence for a program writer to be cheated by a software publisher, distributor or dealer. Although everyone may not be motivated by honesty, most will not soon forget the turmoil caused by a well-known corporation that didn't leave anyone out when they turned their attention to the theft of their popular and lucrative game program.

But there is nothing wrong with asking anyone considering purchasing the original program to sign a non-disclosure agreement before the code is delivered. Like the agreements discussed earlier, this should be drawn up by an attorney. Of course, checking out reputations before even beginning a discussion makes good sense.

Unfortunately, a dedicated infringer knows that, even though the law has provided remedies, pursuing an infringement claim is very expensive and often the damages awarded don't even cover the legal costs.

#### What you Sign . . .

But, it is the end-user who does not bother to read or try to understand the agreement which is part of a legitimate software transaction and is signed by purchaser-user upon delivery of the software who may be the worst offender. The agreement states that except for archival or backup copies, "the user shall make no copies of any kind unless specifically authorized to do so by the selling company." The user further acknowledges that "everything contained in the program is not only copyrighted but also constitutes a trade secret and must be safeguarded by the end-user." It goes on to say that "the end-user shall not copy, reproduce, remanufacture or in any way duplicate all or any part of such product whether modified or not or translated into another language or not, or any documentation or any other material provided by the said company." There is even a clause which says that "in event the agreement is breached, the end-user is liable for damages as may be determined by the courts."

What some end-users do not realize is that the program use is only permitted on the particular computer for which it was purchased. Octopus International can't buy one copy of Data Base X and then make copies for each of their 587 branches worldwide.

#### The Creative Employee

On the other side of the coin, even programmers who take precautions can find unexpected complications. What can happen when an employee works up a program using his employer's computer or time, or writes a program at home, but gives it a trial run at work?

This can become complicated if the employee was hired as a programmer or to make the employer's computer more efficient. If an employee is paid to be creative, there may be an obligation to share income from outside activity with the employer.

Some employers have decided that since programmers are paid to be creative, that outside creativity is a result of their employment. Therefore, since machines paid for by the company are being used to educate employees, anything produced as a result of that knowledge should be shared equally.

If there is no specific agreement between employer and employee that spells out ownership rights to programs which are created under those circumstances, even if the material is actually produced elsewhere, employees should look for some good advice before tinkering around, even at home.

This kind of situation can arise in a university or college computer center. Academic institutions are taking a lot of interest in work created in their facilities. With the growing pressure on professors to computerize classroom work such as problem solving, etc., a lot of money is going to be made by programmers who can put this information in machines. Universities are facing budget crunches, which has sharpened their desire to participate in the capitalist system.

A question that arises is, for instance, when a teacher or professor composes lessons, which are then programmed through the expertise of someone who knows how to make the computer work, and that program is developed in the computer center, who legally owns the finished product and what are the rights of those who played a part in its creation and development?

It is not only academia but also business that is beginning to assert their rights to anything that may have been in any way funded by them by being produced in their shops. If a program is created within their facilities, they are demanding a part of the return.

Each employee or student needs to have a clear understanding of the responsibilities and obligations to the party who furnishes the machine and materials, otherwise he/she could find that an employer may own all rights to any work which he has directed or controlled in any way.

If an employee-employer contract has already been signed, the fine print should be read carefully. There could be some surprises in store for the employee.

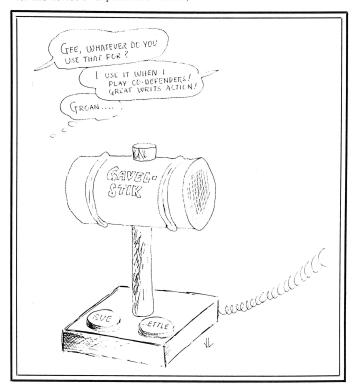
If there is no signed contract, it may be wise to discuss any restrictions when considering a position to avoid misunderstanding at a later date. Employers have been known to claim that knowledge gained on the job provided the impetus for software creativity or that new programs were created from elements of software that had been paid for by the company.

Team projects can also create problems. There may be varying degrees and kinds of responsibilities involved. If this is a work-for-hire situation, that is, if those involved have been hired to develop the program for a company, the employer becomes the author of the program and automatically owns the copyright.

But when an independent team works together in developing a program, this is considered a work of joint authorship and a formal contract should be drawn up which defines each members relative rights.

Until the courts make final determinations in regard to software ownership and rights, anyone involved with computers and software, in any capacity, will have to depend on the individual attorney's interpretation. In addition, it is up to each user and writer to become knowledgeable about his own responsibilities. The courts seldom take ignorance of the law as an excuse.

(For more complete details about copyright and trade secret procedures, see The Software Legal Book, by Paul S. Hoffman, Carnegie Press, Madison, NJ. Although written in 1980, it provides a clear explanation for the novice or experienced reader.)



## Copyright Registration for Computer Programs

#### Definition

A "computer program" is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about certain results.

#### What to Send

- A completed Form TX;
- A non-refundable Filing Fee payable to the Register of Copyrights;
- One copy of Identifying Material (see below).

#### **Extent of Copyright Protection**

Copyright protection extends to the literary or textual expression contained in a computer program. It is not available for ideas, program logic, algorithms, systems, methods, concepts, or layouts. It is also important to understand that once a program is deposited with the Copyright Office, it is available for anyone to see.

#### **Deposit Requirements**

For published or unpublished computer programs, one copy of identifying portion of the program, (first and last 25 pages), reproduced in a form visually perceptible without the aid of a machine or device, either on paper or in microform, together with the page or equivalent unit containing the copyright notice, if any.

The Copyright Office believes that the best representation of the authorship in a computer program is a listing of the program in source code.

Where the applicant is unable or unwilling to deposit a source code, registration will proceed under Rule of Doubt policy upon written assurance from the applicant that the work as deposited in object code contains copyrightable authorship.

If a published user's manual (or other printed documenta-

tion) accompanies the computer program, deposit two copies along with one copy of identifying portion of the program.

#### Machine-Readable Only Works

Includes magnetic tapes or disks, punched cards, etc. Acceptable methods of copyright notice:

- 1. Either with or near title or at the end of the work;
- 2. A notice displayed at the user's terminal at sign-on:
- 3. A notice continuously on terminal display; or
- 4. A legible notice reproduced durably which will withstand normal use, on a gummed or other label securely affixed to the copies or to a box, reel, cartridge, cassette, or other container used as a permanent receptacle for the copies.

#### Visually Perceptible Copies

Should contain *all* of the following elements:

- 1. The symbol <sup>©</sup>, or the word "Copyright", or the abbreviation "Copr.";
- 2. The year of the first publication of the work;
- 3. The name of the owner of copyright in the work.

Example: © 1983 John Doe

#### **Effective Date**

Copyright registration is effective on the date of receipt in the Copyright Office of all the required elements in acceptable form.

A certificate of registration indicating that date or a letter indicating why it has been rejected is usually sent within 90 days.

For more information, request Circular R61 from the Information and Publications Section, LM-455, Copyright Office. Library of Congress, Washington, D. C. 20559. Or call the Forms Hotline at (202) 287-9100.

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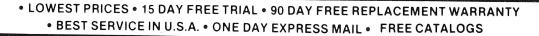
	SLOIF COMSTAR 15"	EPSON* MX-100/Type III	OKIDATA* microline 83a
Warranty This refers to standard warranties. Coverage varies by manufacturer. Complete information is available at your place of purchase.	180 day	90 day	90 day
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CPS	100	80	120
CPI	10.12.17	10.17	10.17
Over 80 Type Fonts	Yes	No	No
Block Graphics	Yes	No	No
Special Character Sets Available	Yes	No	No
Roll Paper Holder Standard	Yes	No	No
Suggested Retail Price Prices shown are based on data from each manufacturer Actual retail prices may vary	\$599.	\$749. 	\$899. —— []
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## The Copywriter

#### Review by Neil Lipson, P.E.

From: Omega Microware 222 South Riverside Plaza Suite 2234 Chicago, IL 60606

or many years the only way to copy unprotected software quickly was to use the old two drive, two controller card method. This had problems as both drives had to have the exact same speed, or errors would result. It took about 25 seconds, so it was the fastest way that I knew of. However, it put a tremendous strain on the power supply, and if you copied the same disk 20 times, the original was read 20 times and received the wear and tear of it also. There is now a better way.

Omega Microware has a new program called Copywriter that modernizes this entire process. You do need a Ramex or Saturn 128K card, but only one drive. You can copy to 8 drives in rapid succession which means you can load and unload while one is copying. Once the disk is read into the computer, it takes only 16 seconds to make the copy, and 16 seconds for each additional copy. If you want verification, it will take 22 seconds. Even the old Apple quick copy will not verify at this speed. If the blank disk is defective, the program will tell you this. It will even tell you if you have problems with the drive.

Keep in mind that you cannot copy protected software. This also applies to disk emulators and other related products. First, back-up the original copy of Copywriter, and put the original away. You can install the 128K card anywhere according to the instructions, but I tried it in a Franklin Ace 1000 in Slot 0. If you do this, you must move the jumper on the motherboard to enable Slot 0, otherwise it will use the RAM on the motherboard.

The program is completely menu driven. It is a good idea to write protect the master. I always do this, as you never know when you'll put the wrong disk in the wrong drive. Because the program reads in tracks and sectors and writes them out the same, it can copy CP/M and Pascal as though they were regular DOS diskettes. If you use more than one drive, the program will copy straight through without a pause from drive to drive.

There are three types of errors:

- 1. W error. The track did not write correctly. Probably the drive speed is too fast.
- 2. STEP error. After all tracks are written, the disk is checked to make sure the head stepping hardware worked correctly. If it did not, this error is indicated as the duplicated disk is bad.

3. WRITE PROTECT error. The disk is write protected and cannot be written upon.

If any of these errors occur, re-record the disk. The best production quantities can be acheived by removing completed disks from each drive as they are completed and inserting a new blank disk in that drive. Then, as soon as all duplicates have been made from the first pass, pressing the space bar twice (after the main menu appears) will repeat the duplication process almost immediately.

Needless to say, this program is fantastic for software houses, and clubs. The important thing to remember is that when you purchase the 128K card, it can be used as a second or third drive in the disk emulation mode, so it would be wise to put information on the card that is constantly accessed. That way you have the additional drive with the fast speed.

I have tried just about every fast copy method, and they all have had some type of problems except this one. First, suppose I want to copy the same disk ten times. I can't stand the original being read ten times, but until now I knew of no way around it. Second, when you go back and forth from drive to drive, you must wait for the drive to reach speed. Some programs shorten this time, but it still does take a finite amount of time. Copywriter eliminates all of these headaches.

I have always advocated the 128K cards, as they can do more in one card than almost any other card in your computer. They can do fast copying, disk emulation, printer buffering, memory expansion and more. All this for \$500. On top of that they can replace one of your drives. You still may want to keep both drives, however, for those programs that look for Slot 6, drive 1 and 2. Now, if Omega came out with a pre-boot that would turn the 128K card in Slot 5 into a pseudo slot 6, drive 2 then you could sell one of your drives and away you go. (Or if more software were configurable by users to their system rather than suffering from "Programmer Knows Best"...—PCW.) Of course the Nibble copiers also use the drive 1, drive 2 method, but guess who sells Locksmith? Locksmith could probably be changed, but this may be a major undertaking.

The Copywriter is excellently written with good documentation, and runs very smoothly. It sells for \$99.95 plus \$2.50 for handling and shipping. The Ramex 128K card sells for \$499. I have a separate article on this card in a previous issue. Happy (legal) copying!!

## PDQ II MAKES YOUR APPLE MICRO PERFORM LIKE A MINICOMPUTER

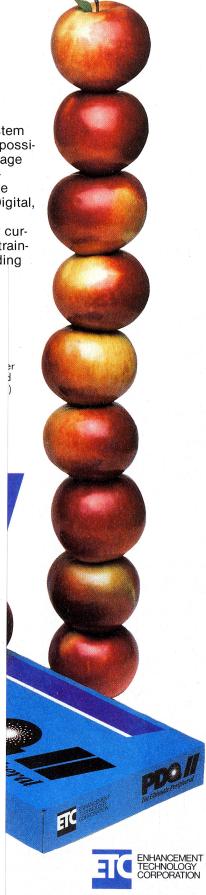
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That's not all—when you plug a PDQ II into your Apple, it will provide the advanced features of the 16/32 bit MC68000 microprocessor. Your Apple will be capable of utilizing sophisticated, "next generation" software products.

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#### PDQ II SYSTEM SPECIFICATIONS

#### Standard Features

Microprocessor

- 16/32 bit MC68000
  10 MHZ
- User Memory
- 256K Bytes RAM
- Integrated Functionality

  Multiple printer/communications buffering
  Pseudo-disk operations
  Track buffering (p-System)
- ETC Software
- ETC MC68000 Assembler
  ETC MC68000 System Monitor
- ETC p-System (version IV) to Apple DOS
- Interface Utility
- Languages and Software Systems Supported

  Applesoft BASIC Compatibility & Speed up
- Apple DOS 3.3
   UCSD p-System (version IV) Interpreter—executes UCSD Pascal, FORTRAN-77 and BASIC P-Code

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#### **Optional Features**

- Hardware
   1 Megabyte RAM (Fall 1983)
- UCSD p-System Development System
   UCSD Pascal
   FORTRAN
   PASC
- BASIC
- Unix-like Operating System
  Artificial Intelligence Laboratory incorporating a
  Deductive Reasoning System (Spring 1984)

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## The Apple-Franklin Case

by Barry D. Bayer

he Champagne bottles (although the French would deny that the bottles really contained Champagne) were popping in Cupertino on August 30 when the United States Court of Appeals for the Third Judicial Circuit reversed the decision of Trial Judge Clarence K. Newcomer denying Apple Computer Inc.'s Motion for a Preliminary Injunction against Franklin Computer Corp., and sent the case back to Judge Newcomer for further consideration. There's been a lot of information (and misinformation) in the press, so perhaps it's time to sit back and sort out what the issues in the case were, and what Circuit Judge Delores K. Sloviter's opinion for the Court of Appeals really means.

As we all know, Franklin Computer developed a computer whose greatest claim to fame was that it would run software designed to run on the Apple II family of machines. We can assume for the purposes of discussing the case that the monitor ROM used by Franklin was a copy of the Apple ROM, and that Apple's monitor program, as stored in the ROM, contained appropriate copyright notices and was registered with the U.S, Copyright office. Apple sued Franklin, alleging violation of Apple's copyright, and requested a Preliminary Injunction which would prohibit Franklin from further dissemination of the ROMmed monitor, until a complete trial was held and a final decision could be reached.

Judge Newcomer, the trial judge for the Eastern District of Pennsylvania, denied Apple's motion last July, stating, in effect, that there was a question, in his mind, as to whether the monitor program was protected by the copyright laws. To me, the major issue raised by Judge Newcomer was that he was uncertain whether a program existing as object code in ROM could be protected at all, and whether such a program did not become, in effect, a part of the machine, and therefore not copyrightable. Judge Newcomer's major support for such uncertainty was a trial decision in the JS&A - DataCash case a few years ago, which seemed to hold that ROMmed code was not copyrightable. That decision, however, was almost universally condemned, was arguably decided on pre-1980

statutes, and was affirmed by the Seventh Circuit Court of Appeals on other grounds. The opinion does exist, but I don't imagine that many other than Judge Newcomer considered DataCash good law. (For interested parties, Judge Newcomer's decision can be found at 545 F. Supp. 812.)

Three days after Judge Newcomer's decision, the Third Circuit ruled in William Electronics v. Artic International that an object code video game program existing in ROM was the proper subject of the Copyright Laws. Apple asked Judge Newcomer to reconsider his decision in light of the Williams-Artic case, but the motion was denied.

I should mention at this point that the juxtaposition of computers and copyright laws is relatively new. Computers and computer programs used to be sold one at a time, with a direct contractual relationship between manufacturer and user. Under such circumstances, contract terms protecting trade secrets could and did limit the wholesale copying and duplication of computer programs. Indeed, when Congress adopted a major revision of the copyright laws in 1976, it threw up its collective hands at the problem of what to do with computer programs, and referred the matter to the Committee on New Technological Uses (CONTU) for guidance. CONTU's report gave rise to 1980 amendments concerning computer programs, but the state of the law, with few definitive decisions, is not at all settled.

Judge Sloviter's opinion on appeal should dispose of Judge Newcomer's uncertainty. Noting 1976 and 1980 amendments to the copyright laws, (and the Court's earlier decision in Williams and Artic) Judge Sloviter held that fixation of an otherwise copyrightable work in ROM is sufficient to obtain copyright protection.

She then continued to address the additional issue which had been raised by Franklin, that a computer operating system is an process, system or method of operation. As ideas, processes, systems and methods of operation are not copyrightable (although at least some of these things may be patentable), and as the monitor embodies a system that makes the computer work, there is some appeal to this issue. Judge Sloviter ruled, however, that an operating system is not, *per se*, uncopyrightable, there being no essential difference, for copyright purposes between an applications program and a operating system. Both fit the statutory definition of a computer program, that is a set of statements or instructions to be used directly or indirectly in a computer to bring about a certain result.

There remains the question of whether the Apple monitor is the "idea" of an operating system to run Apple programs (hence uncopyrightable) or is the copyrightable expression of that idea. Franklin argues, in effect, that the only way to achieve Apple compatibility (which is a perfectly legal thing to try to do) is to use the idea of the Apple monitor; Apple's response, presumably, is either that it should be possible to write another expression of the idea, or perhaps that the "idea" is that of a computer operating system while the "expression" is the Apple monitor. Whichever the arguments, Judge Newcomer has been instructed by the Appellate court to hold hearings on this very issue. It is impossible to tell what Judge Newcomer's final determination of facts will be, and the ultimate ruling by the Court of Appeals, but to use the sports vernacular, while Franklin (a Pennsylvania corporation employing a large number of people in the Philadelphia area) seems to have the home field advantage, Apple has the Big Mo.

An Apple victory, assuming that Apple also successfully defends Franklin's anti-trust counterclaims will surely mean severe disruptions to Franklin. Unless Franklin can develop its own monitor code (and presumably if they could have they would have already done so) this will certainly mean the end of the Apple-compatible Aces. (Apple could, of course, license use of the code to Franklin, but experienced industry watchers claim that is not terribly likely.) In addition, Franklin would be liable for damages for past infringements which could wipe out the company.

A Franklin victory based upon the operating system - application program analysis could void any method of protecting Apple DOS, CP/M, PC DOS, UNIX, the UCSD p-system or whatever other favorite operating system you might have. As with all discussions concerning the protection of intellectual property, one should ask why anyone would bother to go to the expense of writing an operating system if the next manufacturer down the line could then take it for nothing. The traditional answer is that no one would. A Franklin win would not only keep the Franklin Aces in the Apple-compatible business, but would also make it considerably more difficult (if not impossible) for Apple to stem the flood of oriental clones.

Adam Osborne, at a computer show press conference in Toronto last November, claimed that he was undisturbed by a group of Osborne I lookalikes that were surfacing, and that he couldn't understand why Apple Computer was so adamant about fighting Apple clones. While I am not claiming that Osborne clones caused the severe financial troubles that Osborne Computer finds itself in, one can certainly understand the strong position Apple has taken against software dopying. Stay tuned for further developments in the forefront of the copyright laws.

#### AMPERSOFT

There you are, sitting in front of a dead screen, wondering if your Apple has broken down or if your program has gone to sleep.

If you're running into slow executions and long and frequent pauses, AMPERSOFT will give you a lot more time to be creative. It's an entire library of Applesoft enhancements that run at machine language speeds.

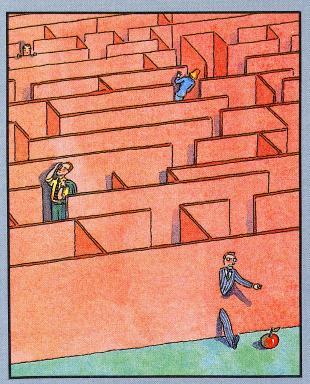
If most programs take away memory, this one gives it back. AMPERSOFT is the only Applesoft enhancement package that puts DOS and itself in the upper 16K of a 64K system, giving you a new usable gain of thirty percent instead of a net memory loss.

And AMPERSOFT is a pleasure to use. All the utilities are accessed from within your Applesoft programs by inserting simple, one-line statements preceded by an ampersand.

They let you Sort sixty times faster than Applesoft. Collect garbage two to three hundred times faster. And format reports to the screen or printer any way you want them.

If you're tired of waiting for your Apple, you don't have to wait any more. AMPERSOFT is here.

#### Utility Routines Library for the Apple II/Ile



Stop Waiting for your Apple.

#### SPECIFICATIONS:

SPEED ADVANTAGES:
Garbage collection — 300x faster.
Sorting — 60x faster.
Disk array Sort/Recall — 16x faster.

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30% more user program memory.
Matrix arithmetic.
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Full PRINT USING formatting for numbers and

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Two-key disk commands.
Compatible with GALE, PLE, FID, MUFFIN, COPYA

Compatible with GALE, PLE, FID, MUFFIN, COPYA and all DOS Toolkit programs.

Allows concurrent residence of Applesoft and Integer BASIC with 32K RAM card, extra 16K card, or ROM card in another slot.

AUTHOR: Cornelis Bongers

SYSTEM REQUIREMENTS:

At least 64K, Applesoft, DOS 3.3 and one Disk Drive. Operates with all Applesoft-Compatible computers including the Apple Ile and the Franklin ACE. Apple Il Plus requires RAM card — 16K or larger.

PRICE: \$49.95 postpaid

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#### MicroSPARC Inc.

## What's on My Text File?

### by Andre Babeanu POM'S de France

ave you ever come across a TEXT file without knowing what's on it? Or has your favourite Apple II ever insulted you with an END OF DATA error when you actually did expect data to be there? Have you ever forgotten the record length of your Random Access file? Or have you ever had any sort of trouble with one of your TEXT files? Sure you did. Here's a small program that may help you.

I wrote this program in Applesoft for two reasons: first it's a bit tricky and my machine language programming isn't very good. Besides, I needed it quite urgently and had no time to lose with assemblers. Third, I wanted it to be easy to understand for everybody. There are some useful hints in there that may interest you even if you're no longer a beginner. The disadvantage is that it is a bit slow (but I don't really need such a program to be faster). However, if you translate it into machine language please let us know about it, at Apple Orchard or POM'S. Now let's go to the subject.

#### What it does

The program in Listing 1 will prompt you for a filename. Look for it in the diskette catalog (Slot 6, Drive 2 is assumed) and check its type. If it is there and it is a TEXT file the program will scan the file and display whatever is on it. At the end of the file it will display the main characteristics of the file: type (sequential or random access; an EXEC is sequential), longest length in bytes, number of fields

for a sequential file, number of fields per record and number of records for a random access one.

A word about that initial file length. What you'll see is the longest length the file ever had. DOS expands when you revise a file to a longer length than it had previously. But DOS does not contract if you revise a file to a shorter length than before the revision. That length number may not be the actual length of the file in its present condition. The solution is to save the file under a new name, delete the old one and rename the new one.

NOTE: this information is not guaranteed 100% true, for it is not directly available on the diskette. It is deduced after some calculation during the scanning of the file (or of part of it if you decide to stop it before it comes to an end). However it will work in 95% of the cases, the remaining 5% being all the weird cases such as random access files the length of which have been redefined two or three times, or which have been overwritten by a sequential file. Provision is made to "flag" such birds.

#### How the program works

#### a) Global analysis

Before you go on reading, I would strongly suggest you to read the Appendix C: Format of diskette information in the Apple DOS Manual; or at least have it at hand length while reading what follows. Unless you do this, the topics below may seem alien.

The program may be divided into three main parts:

- Lines 510 to 710 are the search routine. They will look for the file in the catalog.
- Lines 810 to 1010 achieve the scanning of the file.
- Lines 1210 to 1320 are the end routine and give the final information about the file.

The whole program relies on a DOS routine located in 45111 (or \$B037). Normally, DOS uses this routine to write a sector of the diskette's directory to the disk. But we can use it to read or write any sector from or to the disk (on the specified drive). Therefore we need to put a 1 for reading or 2 for writing in memory location 45121 (\$B041), the desired track number in 45975 (\$B397) and the sector number in 45976 (\$B398). Accordingly, DOS will read (or write) the corresponding sector into (from) the buffer located in 46267 to 46522 (\$B4BB-\$B5BA).

All the work we will be doing relies on modifying DOS to use this routine for reading instead of writing. Thus the program is written in such a way that it cannot be exited by any means (CTRL-C. «RESET»...) without restoring DOS's write mode.

NOTE: The hint about modifying DOS is Bill Parker's from the Sandy Apple Press in San Diego.

The routine simply works by CALLing 45111 after POKEing the desired track, sector and Read/Write mode values in the right location.

#### b) Detailed analysis

Now, take your DOS Manual and let's go on for the tricky stuff.

Line 10: Makes «RESET» a SYNTAX ERROR.

Line 30: Jumps to start of program. To make the program faster the routines used more often are at the beginning.

Line 100: Title centering; title in Z\$.

Lines 200-230: Scan keyboard awaiting for a key to be pressed. If it is ESC then jump to end routine. In line 220 enter Z\$ as is, with the blanks (it's just a suggestion).

Lines 510-570: Introduce the program and ask for parameters. Line 515 selects Slot 6 (SL=slot\*16), Drive 2 for the destination diskette. Please note that it only changes the present slot and drive in the Input/Output Buffer (see DOS Manual pages 94 to 98), not also the previous ones. This means that at the end of the program, the default drive will be the one in use before the program was run, whatever its work slot and drive may have been. For example, if you run the program from Drive 1 and inside DR is set to 2, it will scan the diskette in Drive 2, but when it is through you will be back on Drive 1.

Line 600: This is the loop that will search your file on the consecutive sectors of Track 17 (\$11) - the disk catalog. They are sorted in descending order and sector 0 doesn't interest us as it contains the VTOC.

Line 610: Each sector of the catalog contains the directory entry for seven files. Each entry is 35 bytes long and the first one starts at the 11th byte of the sector (and of the buffer into which it has been read). Thus the value of CK (SB stands for Start of Buffer).

Line 620: The first two bytes of a directory entry (numbered 0 and 1) contain the track and sector of the file's track and sector list (see DOS Manual, p.130). If both are 0 then this is the end of the catalog, the signal to exit the program.

Line 630: If the first byte is 255 this is a deleted file so skip it. This space is available for the next file to be saved.

Line 650: Reads the filename. DOS stores some characters on the diskette with high bit set (all the letters) and others with high bit clear (some punctuation characters). Applesoft handles them all with high bit clear. So we must clear all high bits in the filename if we want to compare a keyboard entry to a diskette one. The reason for this is that the Apple II does not use a standard ASCII.

Line 660: If it's not the file you're looking for, forget it.

Line 670: Found the file. Check to see if it's a TEXT file (p.131 of DOS Manual) on byte 2 of directory entry. NOTE: If you delete Line 670, you can also scan assemblers' source files that are stored as binary files.

Line 700: This is the *only proper way* to leave a FOR . . . NEXT loop before it is completed if you don't exit the program.

Line 820: In case your file has 122,  $244\ldots$  sectors.

Line 825: Reads Track/Sector list into buffer.

Line 840: First byte unused. The two following contain next track and sector of Track/Sector list.

Line 850: Transfer current sector of Track/Sector list into memory to free buffer (see structure of this sector in DOS Manual, p.128).

Line 860: This is the loop that reads the file's sectors. If next track and sector are 0 then this is the end of the file.

Line 870: Reads next sector of file into buffer.

Line 880: Clears keyboard strobe.

Line 890: This loop reads each of the 256 characters in the current sector and treats it according to its value.

Line 900: If a key has been pressed, stop reading and jump to the stand-by routine. X and Y are the cursor coordinates to allow the scrolling to go on at the position it was stopped.

Line 905: If this is the first occurrence of a comma, then ask if commas should be treated as field separators. For a normal TEXT file they should, for a word processor file or an EXEC they should not. Tell the program what you want. Usually you may guess what sort of file you're dealing with by looking at what's in that file before that comma.

Line 910: If the character is a field separator, increment global and partial field counters.

Lines 930-990: These lines handle the 0's (zeros) in the file. To fully understand how this part of the program works we need some theory about file structure (see also DOS Manual, p.124-126 & 136-137). An ASCII 0 (null) byte in a TEXT file indicates the end of data. For a sequential file, this means the end of the file. Thus we store in ZR the number of 0's since the last data byte in order to take it off LN when giving the length of the file.

For a random access file, the ASCII zero may be only the end of a record. This is why we have to continue scanning, in order to find the next record if any. Now, when you OPEN a random access file you have to specify the record length: PRINT "D\$OPENTEST,Lxxx". (D\$ = CTRL-D) When READing or WRITEing, you tell DOS in which record to do it by specifying: PRINT "D\$READ-TEST,Rxxx". DOS will skip R\*L bytes on the diskette (whatever they may be) and then execute the command. If the data is shorter then the specified field length (which it should be) the characters ranging from the end of the data to the beginning of next record will be 0's. The next data byte will be the first byte of the next record (see Figure 1).

> xxxx0000xxxxxx00xxxxx000 <----> R2 R3 x: any character but 0

Figure 1

Lines 930 to 990 look for a zero followed by a non-zero character to identify the starting of a new record. They then restore the record length counter (SP), the field number counter (NF), and the 0's counter (ZR). The detection of 0's is made in line 930 through FP (Flag for Previous character) and FL (FLag for present character). NOTE: FL = NOT C is Boolean; it means FL = 0 if C <> 0, FL = 1 if C = 0.

Line 980 skips the first record in the field number count, as it generally contains information about the file which has a different structure from the rest of the

Line 1005: For X and Y see comment about line 900

Line 1010: Takes next sector of Track/ Sector list

Line 1200-1320: This is the end routine.

Line 1210: If there has been but one record (no "new" one) then obviously this is a sequential file (a random access file with a single record may be considered as such).

Line 1220: This line handles the weird cases. The subroutine in 1600 will compute the greatest common divisor be ween MIN and MAX which are the extreme values of SP. Why did I do this? You probably found out that the procedure in lines 930 to 990 had a shortcoming which appears in two cases:

1) When one or more consecutive records are empty (see Figure 2a).



#### Figure 2a

2) When one or more consecutive records are completely full (see Figure 2b).

#### Figure 2b

In both cases the zero detecting routine will fail, by giving a double (or more) record length and by not taking into account those records.

NOTE: At the beginning I took MIN as the presumable record length. Now, what if you find 16 and, let's say, 24 for MIN and MAX? Obviously the record length is 8. Thus the reason for lines 1600 to 1630.

If D < 3 it is probable that the file is some old stuff that has been overwritten by new data, either a sequential file overwriting an old random access file or a random access file overwriting another one but (re)defined with a different record length or using the B parameter.

By the way, there is a nice bug in DOS regarding this parameter. When you use it in a read and GET the information from the file it will give you the (n + 2)th byte of the file (record). PRINT "D\$READTEST,BO": GET A\$ gives you the second byte of the file, not the first. If you want the first byte, then use PRINT "D\$READTEST": GET A\$ and you get it. If you know why DOS does this and how to fix it please let me know.

This part of the program may seem inelegant, but I am happy with it. You may improve it at your convenience however.

Line 1250: According to the type of file, its length is either LN – ZR (see discussion of lines 930-990) or number of records \* record length.

Line 1280: If MF exists it is the number of fields per record, else NB = 0. NOTE: As an EXEC file ends with two RETURNs (character 141) the number of fields computed will always be one more than actual. You may have wondered why an Applesoft program RUN from an EXEC file skips the first INPUT statement it encounters. Here is the reason. If you write a program that has to be called by an EXEC start it with a dummy GET, something like PRINT "PRESS A KEY TO CONTINUE": GET A\$: HOME . . .

Line 1300: The number of actually defined records is the one corresponding to the record count (as computed by the 0 handling routine). The difference between the computed number of records (by the formula length of file / record length) and this figure will give you the number of occurrences of cases in figures 2a and 2b.

NOTE: This program assumes that record 0 is always defined, even when it is empty and data actually starts in record 1 (or 2 or . . . ).

Line 5000: Error handling. Errors 16 & 255 are due to an attempt to quit the program through RESET or CTRL-C and are not flagged.

Line 5010: Exit program restoring DOS write mode, full screen window and reseting keyboard strobe (this is to avoid inhibiting the first keystroke when exiting program through ESC).

NOTE: Variables X & Y are used to return to the same place on the screen where the program left it, as the cursor needed to quit its position to print the screen headers. We restore it to X + 1, Y + 1 because PEEK(36) and PEEK(37) range from 0 to 39 and 0 to 23, whereas HTAB and VTAB require parameters ranging form 1 to 40 and 1 to 24.

NOTE: Line 1002 allows a nice printer output. We have to use this trick not to avoid getting an extra line feed

this, when we attempt to interrupt work in printer output mode is made (this is not a printing error).

#### Some hints to make this program unnecessary!

For a sequential file: always use the first field to write the number of fields it contains. This will let you know where the actual end of the file is. Else you will never know if what you are reading at the end of the file is actual data or old overwritten stuff (remember, if you rerite a sequential file with shorter data than before, DOS doesn't contract the file, and the old garbage is still there.

For a random access file: always use the first record (R0) to store the record length and number of records of the file. If the record length is too short to contain this information (smaller than 8) then use a two-field sequential file for this purpose. This may seem a waste of space but unless you are really short of space or know exactly what you are doing it may keep you out of trouble.

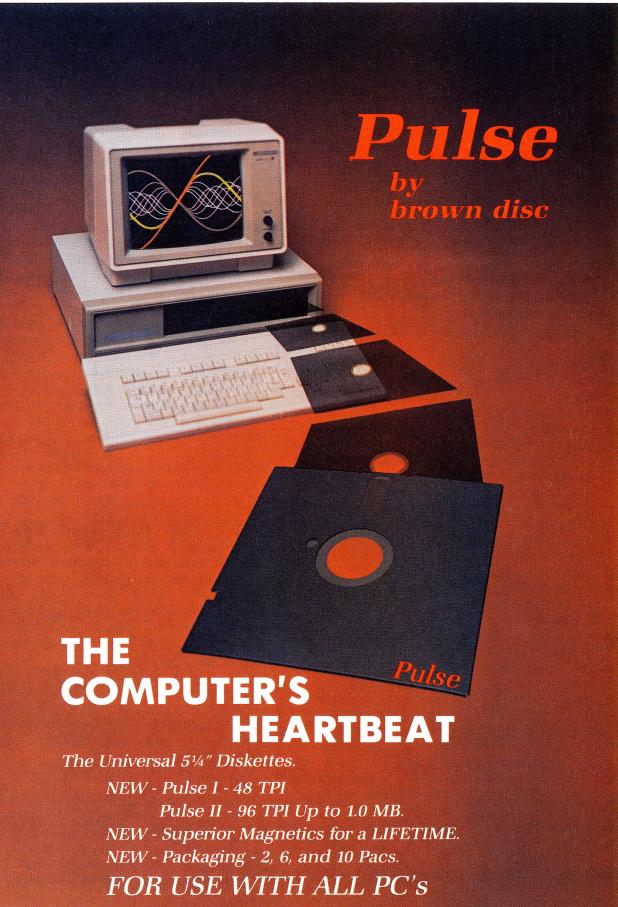
Also for random access, when defining your record length add N + 1 to the sum of the maximum lengths of your data (N is the number of fields per record). You have to do this because DOS puts a RETURN or COMMA to separate your fields. If you don't allow for that extra character when determining maximum length, the data won't fit in its record and you will have funny/tragic results. If you doubt me try the small program in Listing 2 and watch the result. I add one byte to make sure there is at least a zero at the end of each record; you don't really need it.

For all files: don't play with the B parameter unless you're *very* sure of what you're doing. This comment also applies to use of the POSITION command when writing to a file. Be sure you have understood the *DOS Manual*'s explanations about how it works.

#### Conclusion

This program may help some people get out of trouble (I know something about that). While good pro-gramming should make it unnecessary, we present it here as a public service for most people like us.

I tried to make it as user friendly as possible and to trap all possible errors (especially exiting it without restoring DOS). There is one error not trapped: if there's no disk in the drive, it's au revoir, and a full PR#6 is required. I am aware that the principles used in this article may lead to some-thing more exciting (what about a nibble editor?). If you find any errors or have any suggestions I will be really glad to hear about them.





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We're Driving the Drive Market.

- 10 POKE 40286,35: POKE 40287,216
- 20 ONERR 60TO 5000
- 30 GOTO 510
- 100 HTAB 20 LEN(2\$) / 2: INVERSE : PRINT Z\$: NORMA
  L : RETURN
- 150 IF D\$ = "P" THEN PR#1
- 160 RETURN
- 180 IF NOT FL THEN NG = NG + 1
- 190 RETURN
- 200 IF KB = 155 THEN GOSUB 150: HTAB X + 1: VTAB Y + 1: PRINT : PRINT : INVERSE : PRINT "SCANNING ABORTED !": NORMAL : GOSUB 180: PRINT : PRINT "ACCORDING TO THE INFORMATION WE HAVE": POP : GOTO 1210
- 205 PR# 0
- 210 KB = PEEK ( 16384): IF KB > 127 AND KB ( > 155 THEN POKE 16368,0: VTAB 3: Z\$ = "ANY OTHE R KEY TO STOP SCROLLING": GOSUB 100: HTAB X + 1 : VTAB Y + 1: RETURN
- 220 VTAB 3:Z\$ = " ANY OTHER KEY TO CONTINUE ": GOSUB
- 230 GOTO 200
- 510 RW = 45121:TK = 45975:SC = 45976:R = 1:W = 2:SB = 46267
- 515 SL = 6 \* 16:DR = 2: POKE 46583, SL: POKE 46584, DR
- 520 HOME: VTAB 5
- 530 PRINT " THIS PROGRAM WILL ALLOW YOU TO FIND": PRINT
  " OUT WHAT'S ON YOUR TEXT FILES.": PRINT " ALL
  YOU HAVE TO DO IS ENTER THE": PRINT " FILENAME A
  ND WAIT. IT WILL PRINT OUT": PRINT " ALL THAT'S
  IN, WHETHER ACTUAL CONTENT": PRINT " OR OLD OVERW
  RITTEN STUFF."
- 540 VTAB 14: PRINT " SO, WHAT'S YOUR FILE'S NAME ?": PRINT : INPUT " "; A\$: A = LEN (A\$): IF A > 30 THEN GOSUB 1500: VTAB 16: CALL 868: GOTO 540
- 550 HTAB 1: VTAB 18: PRINT " SCREEN OR PRINTER OUTPUT ? (S/P) ";: GET D\$: IF D\$ < > "S" AND D\$ < > "P" THEN 550
- 560 PRINT: VTAB 2:Z\$ = "HIT ESC TO STOP WORK ": GOSUB 100:Z\$ = "ANY OTHER KEY TO STOP SCROLLING": GOSUB 100: POKE 34,3
- 570 HOME
- 600 FOR I = 15 TO 1 STEP 1: VTAB 1: CALL 868:1\$

  = "LOOKING FOR FILE IN CATALOG; SECTOR " + STR\$

  (I): GOSUB 100: POKE RW,R: POKE TK,17: POKE SC,I:

  CALL 45111
- 610 FOR J = 0 TO 6:CK = (SB + 11 + 35 \* J)
- 620 IF PEEK (CK) = 0 AND PEEK (CK + 1) = 0 THEN INVERSE : VTAB 22: PRINT "THERE'S NO SUCH FILE ON THIS DI SKETTE!": NORMAL: 60TO 5010
- 630 IF PEEK (CK) = 255 THEN 710
- 640 F\$ = ""
- 650 FOR K = 0 TO 29:F\$ = F\$ + CHR\$ ( PEEK (CK + 3 + K) 128 \$ INT ( PEEK (CK + 3 + K) / 128)): NEXT K
- 660 IF A\$ ( > LEFT\$ (F\$,A) THEN 710
- 670 IF PEEK (CK + 2) < > 0 AND PEEK (CK + 2) < > 128 THEN INVERSE : VTAB 22: PRINT " SORRY, THIS

- IS NOT A TEXT FILE ": NORMAL : 60TO 5010
- 680 TTSL = PEEK (CK):STSL = PEEK (CK + 1)
- 700 J = 6:I = 1
- 710 NEXT J: NEXT I
- 810 DIM T(122), S(122):MF = 10000:MIN = 10000:SP = -1:X = 0:Y = 3
- 820 IF TTSL = 0 AND STSL = 0 THEN 1200
- 825 VTAB 1: CALL 868:Z\$ = "READING TRACK/SEÇTOR LI ST": GOSUB 100: POKE TK,TTSL: POKE SC,STSL: POKE RW.R: CALL 45111
- 840 TTSL = PEEK (SB + 1):STSL = PEEK (SB + 2)
- 850 FOR I = 1 TO 122:T(I) = PEEK (SB + 10 + 2 \* I):S (I) = PEEK (SB + 11 + 2 \* I): NEXT I
- 860 FOR I = 1 TO 122: IF T(I) = 0 AND S(I) = 0 THEN 1 200
- 870 VTAB 1: CALL 868:7\$ = " READING SECTOR " + STR\$
  (LN / 256 + 1) + " OF FILE": GOSUB 100: POKE TK,T
  (I): POKE SC,S(I): POKE RW,R: CALL 45111
- 880 POKE 16368.0
- 890 VTAB 1: CALL 868: Z\$ = "SCANNING SECTOR " + STR\$

  (LN / 256 + 1) + " OF FILE": GOSUB 100: GOSUB 150

  : VTAB Y + 1: HTAB X + 1: FOR J = 0 TO 255: C = PEEK

  (SB + J): C\$ = CHR\$ (C): LN = LN + 1: SP = SP + 1
- 900 KB = PEEK ( 16384): IF KB > 127 THEN POKE 1 6368,0:X = PEEK (36):Y = PEEK (37): GOSUB 200: GOSUB 150
- 905 IF (C = 44 OR C = 172) AND NOT FC THEN GOSUB 17
- 910 IF ((C = 44 OR C = 172) AND CF) OR C = 13 OR C = 141 THEN NG = NG + 1:NF = NF + 1
- 930 FP = FL:FL = NOT C: IF FP = 0 THEN 1000
- 940 IF FL THEN ZR = ZR + 1: GOTO 1000
- 950 ZR = 0:NR = NR + 1: INVERSE : PRINT : PRINT "THIS

  IS THE END OF A RECORD !!": NORMAL : IF SP > MAX THEN

  MAX = SP
- 960 IF SP < (MIN) THEN MIN = SP
- 970 SP = 0
- 980 IF NR > 1 AND NF THEN IF NF < MF THEN MF = NF
- 990 NF = 0
- 1000 IF D\$ = "S" THEN PRINT C\$;: IF (C = 44 DR C = 1 72) AND CF THEN PRINT
- 1002 IF D\$ = "P" THEN ZZ\$ = ZZ\$ + C\$: IF C = 13 OR C = 141 OR ((C = 44 OR C = 172) AND CF) THEN PRINT ZZ \$::ZZ\$ = "": IF C = 44 OR C = 172 THEN PRINT
- 1003 IF LEN (ZZ\$) = 79 THEN PRINT ZZ\$: ZZ\$ = ""
- 1005 NEXT J:X = PEEK (36):Y = PEEK (37): PR# 0: NEXT
- 1010 GOTO 820
- 1200 PRINT : INVERSE : PRINT "THIS IS THE END OF THE FILE": NORMAL : PRINT
- 1210 TY\$ = "RANDOM ACCESS": IF NR = 0 THEN TY\$ = "SEQU ENTIAL"
- 1220 GOSUB 1600: IF D < 5 THEN TY\$ = "PROBABLY SEQ.": IF NR > 2 THEN TY\$ = TY\$ + ".MAYBE REDEF. R.A."
- 1230 PRINT "THE MOST PLAUSIBLE CHARACTERISTICS": PRINT "OF YOUR FILE ARE FOLLOWING:"
- 1240 PRINT "TYPE :";TY\$
- 1250 PRINT "LENGTH :";:LE = ( INT ((LN ZR) / MIN) +
  1) \* MIN: IF LEFT\* (TY\*,1) = "S" OR LEFT\* (TY\*,

1) = "P" THEN LE = LN - ZR

1260 PRINT LE; " BYTES"

1270 PRINT "NB.OF FIELDS ";: IF TY\$ = "RANDOM ACCESS" THEN PRINT "PER RECORD ";

1280 NB = NG: IF TY\$ = "RANDOM ACCESS" THEN NB = (MF < 10000) # MF

1290 PRINT NB

1300 IF TY\$ = "RANDOM ACCESS" THEN PRINT "NB.OF RECO RDS : "; LE / MIN: PRINT "NB.OF ACTUALLY DEFINED RE CORDS: ";NR + 1: PRINT "RECORD LENGTH (PROBABLE) :":MIN

1310 PRINT : PRINT : PRINT

1320 PR# 0: GOTO 5010

1500 VTAB 22: INVERSE: PRINT "NOT MORE THAN 30 CHARA CTERS PLEASE !!": NORMAL : FOR X = 1 TO 300:Y = PEEK ( - 16336): NEXT : VTAB 22: CALL - 868: RETURN

1600 A = MAX:B = MIN:D = 1

1610 C = B: IF C = 1 THEN RETURN

1620 FOR L = 2 TO C: IF A / L = INT (A / L) AND B / L = INT (B / L) THEN A = A / L:B = B / L:D = D \* L:L = C: NEXT L: GOTO 1610

1630 NEXT L: RETURN

1700 PR# 0:X = PEEK (36):Y = PEEK (37): VTAB 22: HTAB 1: PRINT "COMMAS AS FIELD SEPARATORS ? ";: GET Y\$ : IF Y\$ < > "Y" AND Y\$ < > "N" THEN 1700

1710 VTAB 22: HTAB 1: CALL - 868: VTAB Y + 1: HTAB X + 1: GOSUB 150

1720 IF Y\$ = "Y" THEN CF = 1

1730 FC = 1: RETURN

5000 ER = PEEK (222): IF ER ( > 16 AND ER ( > 255 THEN VTAB 21: HTAB 1: FLASH : PRINT CHR\$ (7): PRINT "ERROR NR. "ERR" IN LINE " PEEK (218) + PEEK (21 9) \$ 256

5010 POKE RW.W: VTAB 23: HTAB 1: CALL - 868: INVERSE : PRINT "EXITING PROGRAM, DOS RESTORED": NORMAL : POKE 34,0: POKE - 16368,0: END

#### Listing 2

10 D\$ = CHR\$ (4)

20 PRINT D\$"OPENFUN,L4"

FOR I = 1 TO 3: PRINT D\$"WRITEFUN,R"I: PRINT "BIRD ": NEXT

40 PRINT D\$"READFUN,R1": INPUT A\$

PRINT D\$"CLOSE"

60 PRINT A\$

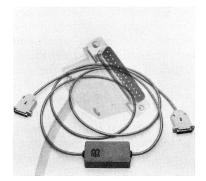
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## Driving Your Disk or, Shortening the Apple /// Daisy Chain

by Gene Wilson
Apple Peelers

he Apple /// computer's on-board or built-in floppy disk drive was not designed to be the sole means of access to stored data/programs. The decision to use the 140k\* disk drive was made in an era when little else was available commercially, in large quantities. One of the primary considerations was to achieve "compatibility" with the Apple II's floppy disk drive(s) to provide a large software "base" for the Apple ///. Technology (and the marketplace) have come a long way since the Apple /// was introduced, sometimes to the chagrin of the designers and marketers.

What then are today's alternatives?

#### Getting By (also called "Avoidance")

Any user trying to "get by" with a single 140K capacity on-board drive will have to make some major compromises while trying to cope with a machine that can load in various system and program files (with up to a current limit of 256K) that can quickly exceed the diskette's total storage capacity. Tasks such as "single-disk copying" become very frustrating affairs as the user is introduced to the joys of frequent 'disk swapping'. In all fairness, some programs will run if a "two-stage boot" is used (which usually involves putting the system programs on the first diskette, then swapping to a second program disk). Pascal? No problem; it simply does not tolerate the single drive environment. Forget it! Clearly then, avoidance is not a solution.

#### The Elegant Solution

If you are willing to nearly double the purchase price of the machine, the ProFile hard disk is sheer delight. With high speed access to over five million bytes of stored data and programs, the Profile is certainly worth considering. There is the limitation of disk back-up, though. How do you channel five megabytes through that built-in drive, 140K at a time? Depending on your back-up needs, this could lead to prolonged disk swapping duties! We'd better keep looking.

#### The "Company" Solution

Apple Computer, Inc. is more than happy to provide up to three external drives (daisy-chained, one behind the other), to give the system up to 560K bytes of floppy disk storage. Just think of the pile of units three high, the cost of all that hardware, and loading up to four diskettes into the drives. This isn't the optimum solution either.

In a nutshell, the problem is this: Apple fell behind badly by not offering disk drives with higher-capacity than 140K. Yes, the 140K drive was great when it was introduced, but that was 1978 or 1979 (I have trouble remembering dates that far back). Apple's engineers went to work on higher-capacity drives for 1980 introduction; 870K(!) drives were announced late in 1982, and can be seen on early production Lisas. Unfortunately, their combination of uniqueness and frailty led to rethinking, interesting internal memos, and reorganization of the division involved. Apple is now recovering from its case of NIH disease (Not Invented Here), and is looking at alternatives. In the meantime, the IBM PC has had 390K drives for more than a year, which is one factor that has led business software developers to favor the Baby Blue unit over the Apple ///.

#### The Micro-Sci Solution

(The answer to my problems and maybe yours, too!)

Micro-Sci sells several disk drive models for the Apple /// computer. Their hottest unit is the "A-143", which offers 560K of floppy storage. Don Norris, President of the Business Apple Group (which started as the "Original Apple ///rs") provided me with the answer; the perfect solution to the problem of getting adequate storage on-line. (Don sells these units, as a club function; they're also at many dealers.)

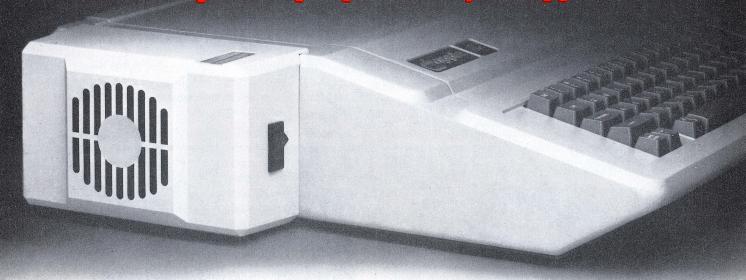
Features of the A-143 include double-density, double-sided (quad density) operation that boosts the Apple /// to 700K with the first external unit (.D2). With three of these (.D2 thru .D4) plugged together, the maximum *on-line* storage becomes a whopping 1.82 megabytes!

One external drive gives adequate storage for most applications. Pascal is completely "up", requiring *no* disk swap-

<sup>\*&</sup>quot;K" here refers to 1024 bytes.

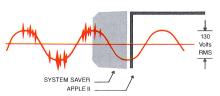
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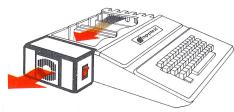


By connecting the Apple II power input through the SYSTEM SAVER, power is controlled in two ways: 1) Dangerous voltage spikes are clipped off at a safe 130 Volts RMS/175 Volts dc level. 2) High frequency noise is smoothed out before reaching the Apple II. A PI type filter attenuates common mode noise signals by a minimum of 30 dB from 600 khz to 20 mhz, with a maximum attenuation of 50 dB.

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As soon as you add 80 columns or more memory to your Apple II you need SYSTEM SAVER.

Today's advanced peripheral cards generate more heat. In addition, the cards block any natural air flow through the Apple II creating high temperature conditions that substantially reduce the life of the cards and the computer itself.

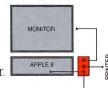


SYSTEM SAVER provides correct cooling. An efficient, quiet fan draws fresh air across the mother board, over the power supply and out the side ventilation slots.

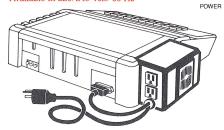
#### For Operating Efficiency

SYSTEM SAVER contains two switched power outlets. As shown in the diagram, the SYSTEM SAVER efficiently organizes your system so that one convenient,

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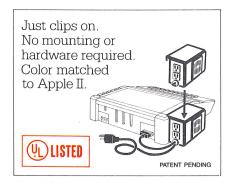


Available in 220/240 Volt. 50 Hz

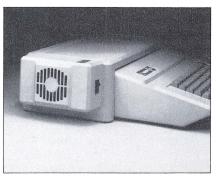


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ping at all! The drive can also be addressed as .X2, so that standard 140K diskettes can be read into the system (no writing, thank you). This enables two-disk copying, or running canned programs requiring two-drive systems.

Initial setup is easy. The required SOS drivers are included. The instruction manual is complete, and gives additional informative tips. One important note here is that the manual says (ever so clearly) that the first "System Parameter" should be set to ONE (1) Disk/// drive. "The MICRO-SCI SOS DRIVER controls all external drives". If that number should read "2" (because you didn't read that point in the instructions the first time through) then little happens when you try to read from the .D2 diskette. The system won't find much worth reading, and there will be a list of I/O errors indicating that things aren't going well.

Backing up the Profile? A maximum of nine diskettes is required. This is a far cry from the sheer volume of 140K diskettes needed for the same task.

What about double-sided, double-density diskettes? Expensive? Exotic? Hard to find, perhaps? The answer was provided by an Original Apple ///rs member. It seems that most quality diskettes aren't much different on either side. They are usually checked on one surface. Many are certified on that surface, and for an extra fee, certification can extend to the back side as well. Certification can be either single, or double density. The 'bottom line' seems to be that just because your diskette hasn't been certified for double-density on both sides doesn't necessarily mean that it won't pass muster. The easy way to find out is to 'FORMAT' and then 'VERIFY' the diskette for full 1120 block operation. If there is a problem, you will be informed!

That does not mean that "bargain" diskettes will work; one Scottish soul found the verification going OK; then the next day the disks didn't work, because of temperature changes. He switched to quality disks, and has had no problem since.

A word of warning from Micro-Sci. There are two Read/Write heads on the A-143. They are offset from one another. If a 35 track diskette (one with a smaller length hole) is used, then one head will 'crash' into the jacket material if the other is fully extended. Words of wisdom from the same friend are that he hasn't seen 35 track openings for a very long time. Nearly all diskette jackets are cut for full 40 track operation, and have a 1 %-inch long head access hole in the jacket. (Just be aware!)

#### Conclusion

There is a number of solutions to disk storage on the Apple /// computer. Not all are equal in scope or cost. An effective solution is to shorten the daisy chain by using a high density external disk drive for program and data storage. This solution is not only cost effective, but allows the Apple /// computer to perform a variety of tasks which would normally require a 'hard disk'. We now hear that the Catalyst is being modified to control these disks in addition to the ProFile; can't wait.

Micro Sci is located at: 2158 So. Hathaway St. Santa Ana, CA 92705 (714)662-2801

Don Norris can be reached through: The Business Apple Group P.O. Box 813 San Francisco, CA 94101 (415)921-3774

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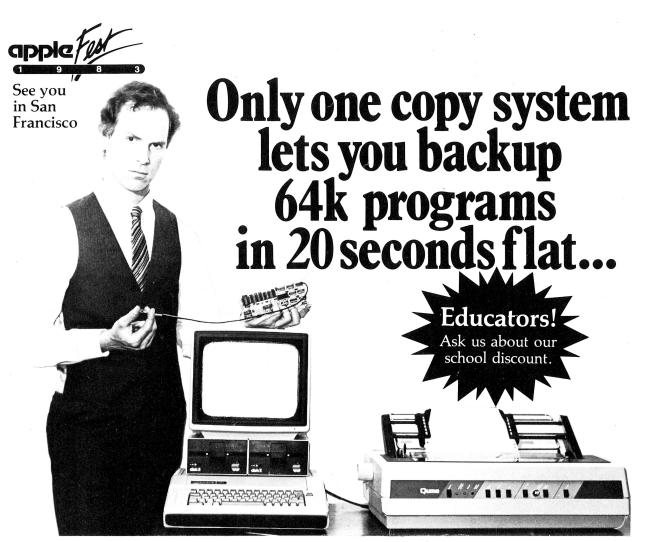
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## A Comparison of Programming Languages Available for the Apple II

#### by Ronald Kennedy

Suncoast Tampa Apple Group

recent issue of *Byte* magazine included an article which compared several high level languages on different computers. The article interested me since it listed the benchmark program as written in the various languages. For my own curiousity, I wrote a simple program which uses an inefficient algorithm to determine the prime factors of an integer. The program was written in several languages all available to Apple II owners including Applesoft, Pascal, TransForth, Microsoft Basic-80, Microsoft Fortran-80, and MicroMumps.

The purpose is merely to compare how to write the same routines in these languages. For example, what does a FOR ... NEXT loop look like in Fortran or TransForth. The program uses IF . . . THEN, Subroutines (with parameter passing if needed), Console I/O, and Comments. Obviously this is not an exhaustive list, but it will suffice for a simple comparison. The program has not been optimized for each language but is structured so that a line-by-line comparison can be easily visualized. For example, the entire program could be reduced to six lines of code in Mumps. All the listings produce the same console input/output formatting and the same answers. Examine the program listings; perhaps you will find a language more intriguing than Applesoft.

Table 1 lists execution time comparisons. These timings should be interpreted with caution since the program deals heavily with integers, which are easily handled by Forth or Fortran. They ignore the graphics of Applesoft, text manipulations of Mumps, etc. I find most benchmarks less useful than the actual program listings; after all, if I can't comprehend the language, who cares how fast it is?

Operating	Language	Code	Execution time (sec)
System	Name	Type*	for integer-1000
DOS	Applesoft	interpreted	18
CP/M	Mbasic-80	interpreted	26
UCSD	Apple Pascal	intermediate	10
CP/M	JRT Pascal v3	intermediate	70
DOS	TransForth	machine	8
CP/M	Fortran-80	machine	6
CP/M	MicroMumps	interpreted	265

#### Table 1

```
BASIC (Applesoft and Mbasic-80)
Listing 1:
10 REM # PRIME FACTOR #
20
   REM
   REM THIS PROGRAM DETERMINES THE
   REM PRIME FACTORS OF AN INTEGER
50 REM
70 \ Z = 0:S = 0:I = 0
80 GOTO 4000: REM MAIN
1000 REM DISPLAY
1010 IF S = 0 THEN 1050
1020 PRINT I;
1030 PRINT "^":
1040 PRINT S
1050
     RETURN
2000 REM CALCULATE
2005 X = Z
2010 FOR I = 2 TO X
2020 S = 0
2030 IF (Z / I) = INT (Z / I) THEN
     I = I / I:S = S + 1: GOTO 2030
2040 GOSUB 1000: REM DISPLAY
2050 NEXT
2060 RETURN
3000 REM NUM
3010 PRINT
3020 PRINT "NUMBER: ";
3030 INPUT ""; Z
3040 IF Z = 0 THEN 3070
3050 GOSUB 2000: REM CALC
3060 GOTO 3010
3070 RETURN
4000 REM MAIN
4010
     HOME
4020 PRINT "PRIME FACTOR ROUTINE"
4030 PRINT "ENTER A ZERO TO END"
4040 GOSUB 3000: REM NUM
4050 PRINT
4060 PRINT
4070 PRINT "GOODBYE"
```

4080 END

<sup>\*</sup>An intermediate code type means that the text file is compiled to a pseudo-machine code which is then interpreted.

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```
Listing 2: PASCAL (UCSD Apple Pascal and JRT Pascal 3.0)
                                                                       Listing 3:
                                                                                   FORTH (TransForth II)
                                                                        ( PRIME FACTOR )
PROGRAM PRIME:
(* PRIME FACTOR *)
                                                                         ( THIS PROGRAM DETERMINES THE )
                                                                         ( PRIME FACTORS OF AN INTEGER )
(# THIS PROGRAM DETERMINES THE #)
(* PRIME FACTORS OF AN INTEGER *)
                                                                         VARIABLE I
                                                                         VARIABLE S
VAR
Z : REAL;
                                                                       : DISPLAY
                                                                          S N2 0
 S, I : INTEGER;
                                                                           <> IF
PROCEDURE DISPLAY;
                                                                               Ι.
                                                                               PRINT " ^ "
 BEGIN
   IF S \leftrightarrow 0
                                                                               S Wa .
                                                                               CR
    THEN BEGIN
                                                                              THEN ; ( END DISPLAY )
           WRITE (I);
           WRITE ('^');
                                                                       : CALCULATE
           WRITELN (S);
                                                                          Z Wa
         END;
                                                                           1 +
 END;
                                                                           2
                                                                           DO
PROCEDURE CALCULATE;
                                                                           0 S W!
  VAR X : INTEGER;
 BEGIN
                                                                           BEGIN
                                                                            Z Wa I /
   X := TRUNC(Z);
                                                                            DUP INT
   FOR I := 2 TO X DO
    BEGIN
                                                                            = WHILE
                                                                               Z Wa I / Z W!
      S := 0;
      WHILE ((Z/I) = TRUNC(Z/I)) DO
                                                                                S W2 1 + S W!
                                                                            REPEAT
       BEGIN
                                                                            DISPLAY
         I := I / I;
                                                                           LOOP ; ( END CALCULATE )
         S := S + 1;
       END;
                                                                       : NUM
      DISPLAY:
                                                                           BEGIN
    END;
                                                                           CR PRINT " NUMBER: "
 END;
                                                                           PAD READLN
PROCEDURE NUM;
                                                                           PAD GETNUM
                                                                           DUP Z W!
 BEGIN
   REPEAT
                                                                           > WHILE
    WRITELN;
                                                                               CALCULATE
    WRITE('NUMBER: ');
                                                                           REPEAT ; ( END NUM )
    READLN(Z);
    CALCULATE;
   UNTIL (1=0);
                                                                       : MAIN
 END;
                                                                           HOME
                                                                          PRINT " PRIME FACTOR ROUTINE "
BEGIN (# MAIN #)
                                                                           PRINT " ENTER A ZERO TO END "
  PAGE (OUTPUT);
  WRITELN('PRIME FACTOR ROUTINE');
                                                                          NUM
  WRITELN('ENTER A ZERO TO END');
                                                                           CR CR
  NUM;
  WRITELN:
                                                                           PRINT " GOODBYE "
```

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```
Listing 4:
             FORTRAN (Fortran-80)
C
        PRIME FACTOR
С
        THIS PROGRAM DETERMINES THE
C
        PRIME FACTORS OF AN INTEGER
        SUBROUTINE DISP (I,S)
        INTEGER I, S
        IF (S.EQ.0) GO TO 1050
        WRITE ( 3, 1020 ) I
1020
        FORMAT (' ', 15)
        WRITE ( 3, 1030 )
1030
        FORMAT ('# ^')
        WRITE (3, 1040) S
        FORMAT ('*', I5 )
1040
1050
        RETURN
        END
        SUBROUTINE CALC (Z)
         INTEGER I, S, X
         REAL
                 Z
        X = INT(Z)
        DO 2050 I = 2, X
         S = 0
2030
         IF ((Z/I).NE.(INT(Z/I))) GO TO 2040
          I = I / I
          S = S + 1
          GO TO 2030
2040
        CALL DISP ( I,S )
2050
        CONTINUE
        RETURN
        END
        SUBROUTINE NUM
         REAL Z
3000
        WRITE (3, 3010)
        FORMAT ('ONUMBER: ')
3010
        READ ( 3, 3030 ) Z
3030
        FORMAT ( F5.0 )
        IF (Z.EQ.0) GO TO 3070
        CALL CALC ( I )
        GO TO 3000
3070
        RETURN
        END
        PROGRAM PRIME
        CALL HOME
        WRITE ( 3, 4020 )
         FORMAT (' PRIME FACTOR ROUTINE')
4020
        WRITE (3, 4030)
4030
         FORMAT (' ENTER A ZERO TO END')
        CALL NUM
        WRITE ( 3, 4070 )
 4070
        FORMAT (' GOODBYE')
```

```
Listing 5:
                MUMPS (MicroMumps)
PRIME ; # PRIME FACTOR #
        THIS PROGRAM DETERMINES THE
        ;PRIME FACTORS OF AN INTEGER
        SET Z=0,S=0,I=0
        GOTO MAIN
DSP
        ; DISPLAY
        IF S=0 GOTO DSP+5
        WRITE I
        WRITE "A"
        WRITE S,!
        DUIT
CALC
        :CALCULATE
        SET X=Z
        FOR I=2:1:X SET S=0 DO CLOOP DO DSP
        IF (Z/I)=(Z I) SET Z=Z/I,S=S+1 60T0 CLOOP
CLOOP
        QUIT
NUM
        : NUM
        WRITE !
        WRITE "NUMBER: "
        READ Z WRITE !
        IF Z=0 GOTO NUM+7
        DO CALC
        GOTO NUM
        QUIT
MAIN
        ; MAIN
        WRITE #
        WRITE "PRIME FACTOR ROUTINE",!
        WRITE "ENTER A ZERO TO END",!
        DO NUM
        WRITE !
        WRITE !
        WRITE "GOODBYE",!
        QUIT
```

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# College Board SAT\* Exam Preparation Series

#### Review by Michael and Lenore Wolgelenter

From:Krell Software Corporation 1320 Stony Brook Road Stony Brook, NY 11790 \$299.95

\*Krell Software Corporation has no official ties with the College Entrance Examination Board (CEEB) or the Educational Testing Service (ETS).

Parents often learn that when the Apple computer first arrives, games are "it". Kids tend to stay home and never leave the computer except for food, school and forced sleep. Keeping score of the latest top ten games, exchanging games and cracking coded software (merely because it is a forbidden challenge) become all-important. One day, usually around the age of 16, keeping score takes on another meaning. The SATs (Scholastic Achievement Tests) are rapidly approaching, and admission to college means attaining high scores on these tests. This software package is an excellent example of the computer as a study tool.

#### Background

The PSATs (Practice Scholastic Achievement Tests) and the SATs (Scholastic Achievement Tests) are timed tests in a multiple choice format. The SATs takes three hours to complete. These tests are structured into two parts. The verbal part consists of vocabulary, reading comprehension, sentence completion, standard written English, and word relationships. The math section includes arithmetic (whole numbers, fractions, decimals, percent, average and motion, and ratios) alegebra and geometry.

Most high school students take the PSATs early in their junior year to gain experience in this type of test and to evaluate their strong and weak academic areas. The actual SAT results are what colleges use to evaluate a student for admission. The SAT is traditionally taken

in the spring of a student's junior year. If the score is not satisfactory, the test can be taken again early in the senior year.

#### **Program**

The Krell Exam Preparation Series consists of 6 diskettes, a short introductory manual and a limited warranty. The diskettes are organized in a SAT multiple choice format. For study purposes, the scoring method and cumulative scores are displayed on the screen after completion of a problem set. An Automatic Learning Feature (ALF) is described in the manual. However, we found it confusing as it was poorly documented. A telephone call to Krell Corporation shed light on its use as a tool to analyze the student's performance. By using the ALF, the computer will personalize the questions in areas where improvements are needed.

Once a problem set is chosen, a computer prompt will ask how many questions the student wants to answer (from 1 to 1000), and will give scoring information. After each multiple choice question, the student can call up the solution to the present question or go on to the next question. If the answer was incorrect, the options include asking the computer to select either a question of the same problem type or a random selection.

When a problem set is complete, the computer will automatically display the score for the correct, incorrect and unanswered questions. This allows the student to immediately see his/her progress. Another valuable feature of this software is the inability to "sneak" answers from the back of the book. Each question must be answered, either with knowledge or guesswork before a solution appears on the screen.

#### **Drill and Practice - Diskettes**

Verbal. This diskette contains three different types of problem sets: word relationships (aviator: radio) with five choices for the answer closest to the example. After the question is answered, the screen will either show an agreement or print out the correct answer. In addition, the screen displays what the word relationship is for that particular question. A dictionary close at hand is a valuable tool for this study section.

The sentence completion portion also has up to 1000 choices per problem set. Each sentence has one or two blanks to be filled in from the multiple choice given behavior ("Obviously, his was abhorred by all.").

Reading comprehension problems refer the student back to the manual for any one of 14 reading selections. The computer will give the number of the selection and will prompt with questions specific to that reading selection. As with all tests, the scoring is for right, wrong and unanswered questions.

TSWE - Test of Standard Written English. This is a two diskette problem set. TSWEI contains programs set 1 thru 6 and TSWE II, 7 thru 12. Both these diskettes give practice in the following subjects: subject-verb agreement, pronoun, verb tense or mood, diction, sentence fragments, dangling modifiers, completeness and consistency, punctuation and parallelism. Each diskette has an instruction set, listing the above subjects and stating that there are 15 sentences per problem. After selecting an answer to each sentence, the computer will display the correct form of the sentence and reason for the grammatical change along with the score.











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TSWE II consists of a long paragraph or a series of paragraphs. Each grammatical problem is taken sentence by sentence as the paragraph grows longer. As with the TSWE I, once the answer is typed into the computer, it will display the correct answer and the type of error contained in that sentence. After several sentences are done, the screen will display the entire paragraph(s) to that point, then continue till the end. At the end, the score will appear on the screen with the entire correct text, if requested.

Vocabulary. This Diskette contains eight problem sets and like all other programs is user selected. Once a particular set is chosen, the screen will display the scoring system as well as the suggestion that a dictionary be used for unknown words.

The student selects from 1 to 1000 words per set. The problem is to select the word "most nearly opposite in meaning to:" and five choices are given. For each question the correct word is given; however, the word meaning is not displayed. Upon completion of the set, a total score is put on the screen and a prompt to continue. Vocabulary problem set # 8 has the option of attaching a printer to print out the questions and answers in hardcopy format.

Mathematics. The math program consists of two diskettes with seven problem sets on one diskette and eight sets on the second diskette. The computer prompts the user to use paper and pencil for diagrams and calculations when necessary. Problem sets 11-13 and 15 are labeled as more difficult than the standard SAT questions and set 11 can be used with the printer.

All of the problem sets give the correct answers after the student types in a response. An option is available to see the solution as well as the choice, to repeat a problem type, or to get a next random question. The geometric diagrams for problem set 9 and 13 are printed in the manual with online descriptions of how to draw the diagrams.

The math section appeared to be the most difficult to use. There is no way of knowing what the subject matter will be with a particular problem set. It is difficult to go directly to a specific study area. If the manual listed the subject per problem set, this inconvenience would be eliminated.

#### Documentation

The manual is a 5 x 7-inch spiral bound notebook and is extremely brief. It lists the aims of the software package, special features (four of which are optional and one of which was not yet available),

proprietary use rights and backup diskette policy. All of this information is followed by booting instructions (software can be used on the Apple, Atari, Commodore, Franklin, IBM, Radio Shack and TI computers).

One page is devoted to a listing of the diskette and general study area. Unfortunately, there is no way to catalog the disk on line, making it important to keep written records of the program set subject matter.

As previously mentioned, the reading comprehension selections and three math diagrams are printed in the manual. (We were not able to find the on line problem for one of the diagrams.) The remainder of the manual is devoted to example worksheets covering the different practice drills.

The math problem sets could use greater clarification and other features would make this manual a more useful tool. As a home study product, general information about the SAT's tests, how to study for a timed test and the creation of a "test situation" would be welcome. Most parents do not have the educational background to provide the learning environment of a classroom teacher. For use in the schools, this program can be a very effective tool, giving the instructor an opportunity to personalize a student's study program.

#### Backup and Updates

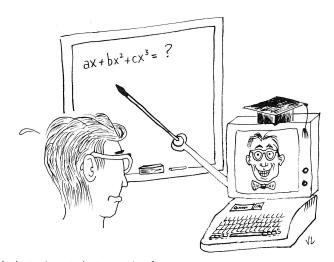
Krell Corporation will provide replacement diskettes for \$10.00 and the return of the damaged diskette. Updates are available as released and the cost is the difference between the new and previously purchased price. As this package is valuable during specific times of the school year, it is important that updates be released with enough lead time to be effective for the coming SATs.

Given the cost of this program, I investigated several other "SAT study programs". College admission is very competitive and much is riding on a high SAT score. The organizations in my local area charge between \$300 and 400 for a 40 hour course plus homework. Each program includes stress situations for practicing test skills and reporting procedure to the parents. Some of these programs offer a combined computer/teacher curriculum. None of these courses will quarantee a score increase; however, they all hint at a substantial increase with their study program. Krell Corporation (with very complex stipulations) will guarantee a combined math and verbal 70 point increase. For the extremely motivated student, the program offers sufficient drill and practice. Until the actual test is given on computers, any home study program for the SATs needs to contain written and timed practice sessions with some method for progress checks.

#### Summary

The use of this software can in no way hurt a student's chances at getting (or improving) a good score. They will need to go beyond the scope of this software in some areas. As a classroom tool, this is an excellent component to a personalized SAT study program.

For the parent working with their high school student, be prepared to find out how much you have forgotten over the past 15-20 years and how much your child presently knows. Be on guard... your adult ego may be in for a big surprise.

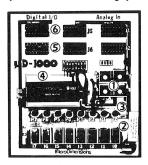


Michael Wolgelenter is a student preparing for the SATs. Lenore Wolgelenter maternally wishes him good luck on the test and is the former Director of Sales Support for Syntauri Corp.

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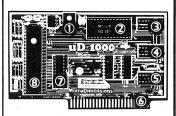
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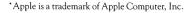
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# A Data Base for the Masses (of Data) A Layman's Exposure to dBASEII by Al Azose

When the company I work for bought an Apple three years ago, we decided we needed a data-base program for some of our smaller data-base applications. These were the applications that couldn't be handled by our IBM mainframe because either the scale was too small, or it required intense user-interaction more suitable to micros. The only Apple data base software available at the time was an unwieldy, slow, and cumbersome program called CCA-DMS (for Creative Computer Applications - Data Management System). It cost all of 100 dollars, so I guess we got what we paid for, as the saying goes. The program was awkward to use and the documentation was utterly useless. In fact, the manual would make an excellent example of how not to write a manual. Still, we used it to a large degree simply because we became accustomed to it, not because we fell in love with it.

A year or so later, there were several data base programs available for the Apple, such as DB Master, PFS Report, Data Factory, and VisiFile. We decided it was time for a new one since we now had a choice, so we flipped a coin and chose VisiFile in the belief that anything had to be better than CCA-DMS. VisiFile proved to be somewhat of a disappointment even though it was a quantum leap ahead of CCA-DMS in performance, sorting time, and documentation. First of all, VisiFile didn't waste time physically sorting files, it "indexed" them. Indexing is an old mainframe technique wherein you only sort one or more fields, and then refer to the main data base for a file search through the record number. Also, VisiFile featured the fancy "horizontal menu" system, where the menu appears horizontally at the top of the screen, and you simply press «RETURN» while a menu selection is highlighted by the

Another winning feature of VisiFile was its ability to perform its functions by merely selecting options with a minimum number of keystrokes. With CCA-DMS, you had to type in your options interminably, and it was very unforgiving of any errors

made in the process. As a friend put it, any options you entered were "chiseled in granite". However, VisiFile, like CCA-DMS, was limited in its data search and manipulation abilities to the boundaries of the program's built-in features, such as they were.

A couple of months ago, we decided to upgrade our Data Base system again, this time with a CP/M system. Thanks in large part to the recommendation of the "Answer Man" in our Apple Club Newsletter, one Bruce Perelman, we purchased a CP/M data base program called dBASE II. This time I think we've struck paydirt, and it looks like the mother lode.

dBASE II is not merely a data base program, it's a data base language, using commands in honest to goodness English, and the syntax is refreshingly simple to learn. As a result, the user has a choice of processing data either by a direct query mode, or by writing programs using essentially the same commands as in the query mode. dBASE II is powerful and flexible enough to process practically any application that requires manipulation of data. Thus, if programmed appropriately, it can handle jobs like a general ledger, payroll, inventory control, accounts payable, accounts receivable, and so on, in addition to your more customary databases such as mailing lists or whatever. The publishers claim that programming in dBASE is considerably simpler and faster than programming in either COBOL or BASIC, and takes considerably less coding

One feature that's come in awfully handy is its ability to accept text files from VisiFile and CCA-DMS (and undoubtedly from any other Apple/DOS Data Base program). Needless to say, this has enabled us to continue updating our old files without having to re-enter tons of data. This transfer of files was accomplished by using a CP/M program supplied by Microsoft called APDOS, which enables you to transfer any Apple text file from an Apple DOS disk to a CP/M disk. It's an extremely convenient feature, and a very useful one for which Microsoft is to be commended. Thereafter, to make the transfer complete, it's simply a matter of following some simple directions in the dBASE manual.

Once dBASE is up and running and you want to create a file (this is all without any programming, mind you), you simply type "CREATE", and respond to the prompts to name the file and define the fields. To add records, simply type "APPEND" and you're on your way. dBASE allows you to have up to 65,535 records per data base file, but it's not likely that the average user will ever have anywhere near that amount. If you do. better do it with 8-inch floppies or a hard disk drive. Your 5 1/4-inch disks will give you a "Disk Full" message long before you approach the 64K maximum. dBASE also allows 1,000 characters per record, 32 fields per record, and up to 254 characters per field, but this depends on which comes first. In other words, if all your field sizes are the maximum 254 characters, then you're limited to but 4 fields (instead of 32) because you will have already reached the maximum record length of 1,000 characters.

dBASE was built to be used with at least two disk drives, but if you only have one disk drive, don't despair. If you don't mind squeezing your file data onto the program disk, it can be used with a one drive system. However, a one drive system means that you can't have any extra-large data files since each disk only has about 64K left to play with after allowing for the dBASE program itself. This also means that you have to do a lot of creative (i.e., constant and careful) deleting of old index files in order to assure that there's always enough room for your main data base file and any updated index files. Copying entire disks is no problem with a one-drive system, but copying individual files is a little trickier, and involves using the CP/M DDT utility (Dynamic Debugging Tool). It's also interesting to note that dBASE doesn't care whether you use a 40 or 80 column screen - although the latter is highly recommended.

The fun part of using dBASE comes from its extraordinary data manipulating abilities. Here are some typical examples of the syntax:

LIST ALL NAME FOR CITY = "BOSTON" DELETE ALL FOR AMOUNT = 0REPLACE ALL GROSS WITH NET \* 1.065

It will sort (and/or index) a 500 record file in a matter of a few minutes, depending on the length of the key field. It can find any record on an indexed key almost instantaneously, replace whole fields with specified data or values, display, compare, find, delete, compact, append from other files, and much more using a potentially unlimited variety of designated specifications. But the real beauty of dBASE lies in the fact that it lets you manipulate the raw data directly without the necessity of going through a slowpoke, inflexible, intermediary program with its interminable menu selections. And if you're resourceful enough to write your own programs, they can be custom tailored to meet your minutely specific requirements. In order to write dBASE programs, you have a choice of using either a CP/M text editor (such as WordStar) or a built-in program editor. The built-in editor should only be used for "quick and dirty" programs since it doesn't contain the standard textediting features like global search and replace, among others. Still, it's very easy to understand why over 50,000 copies of dBASEII have been sold since it first came on the market two years ago.

Yielding to temptation, I brought the program home for several weekends to practice on. The mere fact that it was in my possession, even temporarily, caused me to think of all the applications that I have at home for data bases, and that's when I really went overboard. In addition to the useful, rational things like a checkbook, a budget, and a household inventory, I planned on doing databases on all my Apple disks and programs, on my books, my record collection, audio tapes, video tapes, vacation slides, etc. etc. . . . and that was just the beginning. The thrill finally wore off when I calculated that I would be keying in data until the year 2007 if I completed all my planned data bases. I finally settled on just the checkbook even though that alone took up considerable data entry time.

When I first started playing with the data manipulation features of dBASE, it was more enjoyable than Choplifter and Pac Man combined. All I wanted to do was manipulate data ("I can't eat dinner now! I'm doing a triple sort!"). After I entered my checkbook data, I then proceeded to manipulate the bleep out of the file, indexing it seventeen ways from sundown just for the sheer enjoyment of flexing my software "muscles". I even did data searches on practically every piece of data in every field even though I knew what the results would be. (Example: DISPLAY FOR "CALIF" \$PAYEE - to find how many payees had the string 'Calif' in their name.) It was a pleasure to use a program that amply provided what good software should: Power.

Would I ever go back to using those older data bases? Not likely now that I have seen the light.

dBASE II was written by Wayne Ratliff, and is distributed by Ashton-Tate of Culver City. The price has ranged all the way from the list price of \$700 to a special sale price of \$459 provided by several different vendors. A special Apple 48K version is available for \$400, but it's somewhat more limited than the 64K version. At any price, dBASE is one hell of a data

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# KoalaPad and the Micro Illustrator

Review by Barry D. Bayer

ou've tossed away your broken game paddles, and your joystick's a little rusty, and not all that precise? Graphics Boards and Light Pens look interesting, but in the \$300 or \$500 or \$700 price class, they are more than a bit expensive? You've been drooling over Lisa's Mouse, but nobody makes one for the Apple II or ///, yet, and who can afford a Lisa? Your 8 year old runs circles around you with Logo's Turtle Graphics?

Well, don't despair. A hot new product called the KoalaPad Touch Tablet, with a manufacturer's suggested retail price of \$125, may be just the gadget for you.

An easy to carry, wedge shaped instrument 20 cm by 16 cm, and 4.5 cm at its highest, the Apple version of the KoalaPad plugs into the Apple game port (no D9 connecter is available for the //e backplane as of this writing) with electrical connections to PDL(0) and PLD(1), SW(0), and SW(1). Your Apple thinks that the KoalaPad is a joystick or a pair of paddles, and no special drivers are necessary to use it.

The drawing surface of the KoalaPad is roughly 11 cm square. Pressing a part of this area vigorously with a finger, or with the stylus provided with the product, causes readings theoretically from 0 to 255 to appear at PDL(0) and PDL(1). 0-0 is in the upper left hand corner of the surface, and 255-255 in the lower right. PDL(0) reads the vertical axis and PDL(1), the horizontal. The left pushbutton is connected to SW0 (memory location -16287) and the right pushbotton to SW1 (memory location -16286).

The buttons are large, easy to depress and very responsive, and may be your instrument of choice for Pinball, or other games that make extensive use of the buttons. On the other hand, although the KoalaPad will supply input which is recognizable to any games which would ordinarily use Paddles or the Joystick, many games just don't "play" well with the KoalaPad. The "starship feel" of a joystick just isn't there.

The KoalaPad is or will shortly be available for IBM, Commodore and Atari computers, also. This review is based solely on my experience with the Apple version.

KoalaPad comes with the Micro Illustrator, an excellent drawing program written by Steven Dompier, which utilizes the instrument's capabilities, and shows how the KoalaPad can be used in programs that have nothing to do with drawing. Upon booting the program, one can select between 18 colors (9 in each of two "sets"), 8 drawing modes (including boxes and circles, points and lines) and 8 different drawing "brushes". A small illustration of an option is included in each menu box, so you don't have to know how to read to operate the program. A "HELP" screen is even available, (I guess you do have to know how to read to get any help) although as the operation of the program is not terribly complex, a lot of "HELP" should not be needed. Each option has a separate box on the menu screen. Pressing on the KoalaPad will cause a cursor to appear on the screen. Touch the stylus to the KoalaPad at a spot which is analagous to the position of the box containing the option to be selected, press one of the buttons on top of the KoalaPad, and a corner of the selected box will turn white, showing the selection.

Pressing a button without pressing the drawing surface will switch your monitor to the high resolution graphics screen. Now, anything you "draw" on the KoalaPad will appear on your monitor sreen. (Some drawings must be coordinated with a push button, but that's a relatively minor matter.) Any enclosed areas on the screen can be "filled" with a selected color. Of course, when you've completed your "picture" you can save it to disk as a standard DOS 3.3 binary picture file. The Micro Illustrator is similar to a number of other programs on the market, but combined with the KoalaPad it really stands out.

After several days of moderate abuse, my 8 year old and his friends were unable to seriously damage the KoalaPad, which is enclosed in a sturdy plastic case. They were entranced by the Micro Illustrator which immediately surpassed a variety of computer games as the program of choice. And yours truly, an artistic illiterate, was able to create several aesthetically pleasing, non representational displays in only a few minutes.

The KoalaPad was invented by David Thornburg who, you may not be surprised to learn, is an alumnus of the Xerox Corporation's Palo Alto Research Center, commonly known as Xerox PARC. The work of other former employees of this well known artificial intelligence think tank is visible today in Apple's Lisa, and VisiCorp's announced but as yet undelivered VisiON, to name two, and is responsible for much of the excitement surrounding "mouse" pointers. While the Koala-Pad is, in one sense, just another device which can be used to "point" to parts of a computer screen for drawing and menu selection purposes, Thornburg claims that it is easier and more convenient to use than any of the other "pointing" devices.

If a template is placed on the KoalaPad drawing surface, the cursor may be placed directly over a specific portion, without moving through other points of the screen, something that is difficult or impossible to do with Mouse or joystick. One can also place a drawing over the KoalaPad surface, and trace it into the computer. Because the KoalaPad is light enough to hold in the hand, one can sit back in a chair, and draw, something that is difficult to do with a light pen. As far as I am concerned, however, the real breakthrough of the KoalaPad, compared with the other standard pointing devices, seems to be the extremely reasonable cost and ease of interfacing.

Easy to interface? The owner's manual suggests a variation of the following program to read the KoalaPad:

10 X = PDL (0) $20 \ Q = SIN (123)$ 30 Y = PDL(1)40 PRINT X, Y

(Line 20, of course, merely inserts a delay to insure proper reading of PDL(1), as the two paddles should not be read one immediately after the other.)

The left and right push buttons can be read with a PEEK (-16287) and PEEK (-16286), respectively, with a value greater than 127, if the button in question has been depressed.

As a rough test of linearity and stability of KoalaPad, I placed a square of graph paper on the drawing surface, and ran the following program:

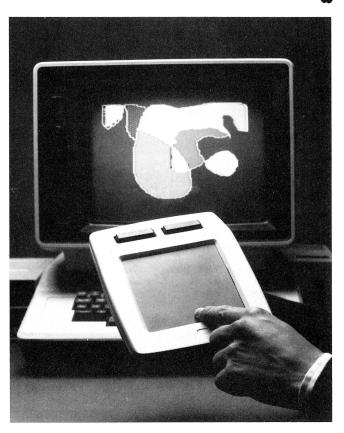
10 GR 20 COLOR = 130 X = PDL(0): X = X/6.2 $40 \ Q = SIN (123)$ 50 Y = PDL(1): Y = Y/6.260 PLOT X, Y 70 GOTO 30

For those of you who have never delved into Apple's Low Resolution graphics, lines 10 and 20 turn the machine into Graphics Mode and set a color, and line 60 causes the display of a small box (40 to the line) at position INT(X), INT(Y). Line 50 merely insures that neither X nor Y has a value greater than tolerated by Applesoft. A block, once plotted, remains on the screen until cleared.

RUNning the program, and using the stylus to hit a specific intersection on the overlay show the repeatable resolution of the KoalaPad to be good. (Occasionally a box appears quite far away from the appropriate spot on the screen. I don't know whether this is a result of a distortion of my particular copy of KoalaPad, or endemic to the product, generally, but although it was clearly visible in the test, it didn't seem to bother the drawing program.)

The manufacturer, Koala Technologies Corporation, envisions a steady stream of software utilizing the capabilities of the KoalaPad in a number of different ways, and plans to market a package containing subroutines to be used by interested programmers. A music tone recognition teaching program was demonstrated, and should be available by the time you read this. And I am reasonably certain that programs utilizing KoalaPad capabilities will soon begin to appear in User Group public domain software.

Of course the KoalaPad is not perfect. (I've already mentioned the lack of a D9 connector for the //e.) Also in the "wouldn't it be nice to have" department, how about a coiled cord. Also, the attractive packaging promises a little more than it delivers. The KoalaPad as packaged will not enable you to "Make music, play strategy games, and learn new alphabets..." Presumably, you might do all of these things using the KoalaPad, but you'd better figure out how to write or obtain the software first. But if the reaction of my test group of 8 year olds is any guide, the KoalaPad is going to be a big seller.



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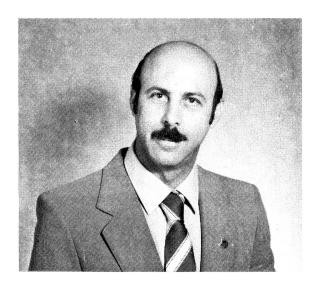
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#### From the IAC Office . . .

Ken Silverman, Executive Director



In the next issue of the **Apple Orchard** you will see several ads dealing with the availability of good "public domain" software through the International Apple Core. The IAC has, and still plans to continue, to give a disk each month to our member user groups of "public domain" software - FREE. The software is then to be included in the disks made avail-

able to the members of these user groups. This doesn't happen in every user group. Some don't have the facilities to duplicate, package, and distribute this type of software. This has caused some dialogue with end users as to how they can obtain these "public domain" disks.

It would be impossible for the IAC to duplicate and sell all the software that is currently in "public domain", but what we can do is make available, at a minimum cost, the best. Each "Best Of" will be in the form of a theme and packaged in the new 3Pak.

The first of the new 3Paks will be on the theme of EDUCATION. The three disks will be the following: 1) AppleSoft Tutorial, a self help program to help learn how to program in AppleSoft. 2) Machine Language Tutorial, another program to teach the ins and outs of machine language programing with some tools like an assembler to help. 3) A disk full of math programs, programs like Hex Converter, Metric Converters, etc. A full listing of the programs will be in the ad in the December issue. If you wish a head start on getting your 3Pak just write or call the IAC and order yours. The price is \$24.95 for all three disks. We will accept calls that wish to charge the order.

In the future we will have a LOGO TOOL KIT 3Pak, a GAMES 3Pak and we hope very soon a HOME FINANCIAL 3Pak. Please do not order these until we notify you that they are available.

The IAC is planning to release, before Christmas, its own CALC program. It will have all the features of VisiCalc plus more. The planned price will be in the range of \$84.95. Look for the introduction of IACalc.

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   10 MHZ
- User Memory 256K Bytes RAM
- Integrated Functionality

  Multiple printer/communications buffering
  Pseudo-disk operations
- Track buffering (p-System)
- ETC Software

  ETC MC68000 Assembler
- ETC MC68000 System Monitor
   ETC p-System (version IV) to Apple DOS Interface Utility
- Languages and Software Systems Supported

  Applesoft BASIC Compatibility & Speed up
- Apple DOS 3.3
- UCSD p-System (version IV) Interpreter—executes
  UCSD Pascal, FORTRAN-77 and BASIC P-Code

#### **INSURANCE FOR THE FUTURE**

PDQ II provides a powerful p-System run time environment, making it possible for your Apple to take advantage of many of the hundreds of highquality p-System applications...the same applications available for Digital, IBM, HP, and other computers.

PDQ II technology makes your current investment in software and training more productive, while providing an almost unlimited growth path.

Now wouldn't you like to have the PDQ II performing for you?

PDQ II comes with a full one year warranty and will be available through your local Apple dealer beginning in July. If you simply cannot wait, send your check or M.O. for \$1495 (postage included) to: Enhancement Technology Corporation, P.O. Box 1267, Pittsfield, MA 01202. Mass residents must include 5% sales tax.

We'll send you the PDQ II. P.D.Q.!

The Ultimate Peripheral

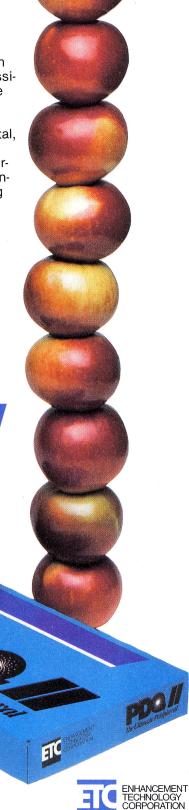
#### **Optional Features**

Hardware
• 1 Megabyte RAM (Fall 1983)

- UCSD p-System Development System
   UCSD Pascal
   FORTRAN

- BASIC Unix-like Operating System
- Artificial Intelligence Laboratory incorporating a Deductive Reasoning System (Spring 1984)

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# MacInker

by Neil D. Lipson, P.E.

From: Computer Friends 100 NW 86th Ave. Portland, OR 97229 (503) 297-2321

acInker is such a simple, yet cost effective device, I wonder why no one has thought of it sooner. It is simply a device to re-ink your printer ribbons. If you use your printer a great deal, you can appreciate the savings.

When I received my MacInker, I immediately tried reinking some ribbons. I ordered the Prowriter version for my dot matrix printer. At first I didn't add enough ink to the rollers, but after a few tries I figured out how much to add (I merely added enough until the ribbon started to get darker). This is the toughest part of the entire process. From then on, it is simply a matter of adding a little ink to the roller, and you are done for life.

One thing that I did notice (boy, did I notice!) is that the little motor underneath the device gets quite hot. Be careful when handling it. I was told by the manufacturer that they are providing a different motor which runs much cooler, so expect to see this on the market very shortly. I immediately began re-inking some ribbons, and it worked perfectly. When I looked at the ribbon after it hit the roller, I was expecting it to be soaked with ink. However, there were only little spots inked. This is all that is needed, however, as the ink will spread evenly in a few hours.

The basic instructions are to ink the rolls in the following fashion: The rolls have a small aluminum tube which protrudes from one end of the felt pads. The end which protrudes will be used in the up position over the two posts on the inker table. The top half of the roll acts as a reservoir for the ink and the bottom half to hold the roll upright. The quickest way to ink these rolls is to hold them by the extended tube and drop some ink on the felt pads while turning them during this process. The ink will be quickly absorbed by the pad. Continue doing this until it takes quite a while for the ink to be absorbed. You then add ink to the top reservoir and in about 15 minutes you're ready to go.

I would use this inker only for dot matrix printer ribbons. as I never liked the quality of fabric ribbons for daisy wheel printers. But if you use these fabric ribbons on your daisywheel, the MacInker is excellent for it.

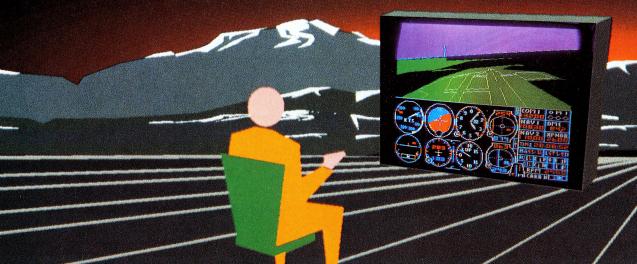
At first glance, the cost of \$54.95 seemed a little high, but in figuring out how much ribbons cost me (\$8 each), the unit paid for itself in 7 applications, which is very quick indeed. It is very cost effective. Jimmie Moglia mentioned in his letter to me that the ribbon he used for the letter was re-inked about 32 times. Needless to say, you will save money the minute you buy it.

Computer Friends, which manufacturers the MacInker. makes units for just about every printer. The price varies from \$54.95 to \$69.95 depending on the printer. The ink comes in 2 oz. bottles and costs \$3 a bottle. A pint is \$18.50 and a gallon is \$75.50. You conceivably go into the ribbon inking business. I didn't ask them the prices of a 55 gallon drum of ink. Be forewarned that once you buy the MacInker, you will become a very popular person and many sudden friends will want you to ink their ribbons.

The manufacturers are concerned that the user does not overink the ribbon during first time operation. This point is made repeatedly in the instructions. Since very little ink is required to re-ink properly, their concern is justified. However, even if the user over-inks the first time, no damage occurs to the ribbon and he will get a direct feel for how little ink is required at the next re-inking.

# Flight Simulator II

Apple 11 × Apple 11 × Apple 116



Put yourself in the pilot's seat of a Piper 181 Cherokee Archer for an awe-inspiring flight over realistic scenery from New York to Los Angeles. High speed color-filled 3D graphics will give you a beautiful panoramic view as you practice takeoffs, landings, and aerobatics. Complete documentation will get you airborne quickly even if you've never flown before. When you think you're ready, you can play the World War I Ace aerial battle game. Flight Simulator II features include ■ animated color 3D graphics ■ day, dusk, and night flying modes ■ over 80 airports in four scenery areas: New York, Chicago, Los Angeles, Seattle, with additional scenery areas available ■ user-variable weather, from clear blue skies to grey cloudy conditions ■ complete flight instrumentation ■ VOR, ILS, ADF, and DME radio equipped ■ navigation facilities and course plotting ■ World War I Ace aerial battle game ■ complete information manual and flight handbook.

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# SuperSprite.



## Plug arcade excitement into your Apple computer

Super Sprite is an amazing peripheral card that plugs easily into the Apple's expansion slot. It magically transforms your Apple into an exciting entertainment center for colorful and dramatic animation, realistic sound effects and actual speech.

#### **Sprites Galore**

Only Super Sprite has multi-plane graphics for life-like 3-D animation. Watch your screen come alive with animated characters (sprites) that flit and fly, intersect and interact, and never get in the way of each other. And sprite action can join standard Apple graphics on the screen at the same time.

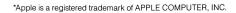
#### Software Support

Every Super Sprite package includes the Ampersprite™ software language that lets you devise sprites in seconds from the keyboard. Plus sound effects and speech! Or, simpler yet, you can buy a commercial game that's already written around the Super Sprite.

Your computer store should have Super Sprite in stock. If not, ask him to order one for you. Suggested retail is only \$395.



15050 N.E. 95th, Redmond, WA 98052, (206) 881-7110 1-800-426-7412



Super Sprite package includes

Ampersprite programming utility

operator's manual.

and demo diskettes.

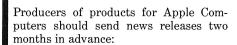
<sup>&</sup>lt;sup>™</sup> Super Sprite is a registered trademark of Synetix Systems, Inc., 1983.

<sup>&</sup>lt;sup>™</sup> Ampersprite is a registered trademark of Avant-Garde Creations. Inc.

# The New Stuff



Edited by Mark L. Crosby



#### NEW PRODUCTS EDITOR Apple Orchard 908 George St. Santa Clara, CA 95050

The IAC cannot be held responsible for claims made by manufacturers.

#### **Contents:**

#### HARDWARE

**Input Output** Memory **Printers/Plotters Miscellaneous** 

MISCELLANEOUS

#### **SOFTWARE**

**Business** (General) Communications **Educational Financial** Games/Simulations **Graphics** Languages (Programming) Personal **Utilities** BOOKS/CATALOGS

The most comprehensive listing and description of new temptations, delicacies, and necessities for your Apple. Notice too that we've made it even easier for you to find out more about these items; just circle the corresponding number on the Apple Orchard Direct Help Card a bit farther ahead in this issue. We'll forward the requests directly to the manufacturer.

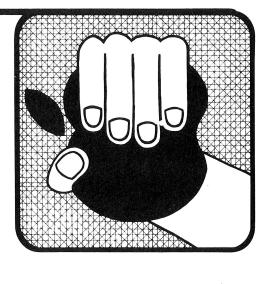
#### **HARDWARE**

#### Input/Output

For the first time, all Apple graphics or text screens can be copied by any printer, at any time, by pushing a button. A software-independent color-graphics printer/ plotter card called PRINT-IT! for any Apple II or look-alike computers has the unique feature of being able to pause any program, print whatever appears on the screen, and continue processing the interrupted program or game. A partial list of standard and color printers already supported includes the IDS Prism; Transtar and Canon color printers. Standard printers include Epson, Nec 8023P/C; Okidata 82, 83, 84, Apple, Star Gemini 10, 10X, 15. In single quantity the price is \$299.00. Circle HelpCard No. 101

Texprint, Inc. 8 Blanchard Road Burlington, MA 01803 (617) 273-3384

The Fast Point is a new light pen and controller designed for the Apple II Plus and / /e. The pen can be used for cursor control and menu picking applications, as well as low-resolution graphics tasks. The pen



has a touch-sensitive switch that generates a signal when the tip is placed against an un-blanked spot on the CRT. Comes complete with software, controller, instructions and a demo disk \$240.00.

Circle HelpCard No. 105 HEI, Inc. Victoria, MN 55386 (612) 443-2500

Hard Disk II system consists of up to 2 full height, 5 megabyte Winchester disk drives, heavy duty enclosure, disk controller, field proven power supply, I/O adaptor, and applicable cabling. 5+5 system is \$1,590.00, 10 system \$1,249.00, 10+10 \$1999.00, 15 system \$1,449.00, 15+15 \$2,299.00. Adaptor modules for most popular microcomputers are \$150.00 each. HD-505 Winchester includes Fixed 5 megabytes, removable 5 megabytes, the adaptor module and a free removable disk cartridge for \$2,490.00.

Circle HelpCard No. 106 VR Data 777 Henderson Blvd. Folcroft, PA 19032 (215) 461-5300 (PA); (800) 345-8102

Mini Taur II disk drive is hardware and software compatible with the Apple II, //e and lookalike computers. Features half and full track accessing capability, 35 and 40-track operation. A band stepper provides faster and more precise head positioning. Gives twice the storage in the same space as a standard Apple drive (if you get two of them). User selectable write protection switch features three modes: normal write protect operation, read only always write protected, and write protect disable allows use of opposite side of the diskette.

Circle HelpCard No. 107 RGB Designs 3375 Woodward Avenue Santa Clara, CA 95050 (408) 748-0400

A new 12-bit Analog/Digital data acquisition card plugs directly into a slot in the Apple II, II Plus, //e or Apple /// personal computers. It provides 16 singleended or eight differential inputs, which are software selectable. On-board firmware eliminates the headaches of machine language driver routines. Simple BASIC statements are sufficient to address the converter through routines located in the on-board ROM. True 12-bit operation over +/-5 volt input range yields resolution of 2.4 millivolts while maintaining a maximum system nonlinearity of less than 0.012 percent. Full 12-bits conversion time is 25 microseconds and a short cycled 8-bit conversion only 15 microseconds. The price of \$599.00 includes instructions.

950 N. Hague Avenue Columbus, OH 43204 (614) 488-6176

Columbus Instruments Int'l. Corp.

Circle HelpCard No. 103

#### **GET STARTED ON** THE APPLE IIe IN **UNDER AN HOUR...**

Yes...at last, computer instruction is available on videotape.

If the computer newcomers in your family are overwhelmed by technical manuals, we have made it easy. We have extracted the most-needed facts and put them in an easyto-understand form. We cover:

- Unpacking and set-up
- Installation of circuit boards and peripherals
- Functions of RAM and ROM
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This videocassette enables the computer newcomer to begin with confidence.

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835-2246 Ext. 35



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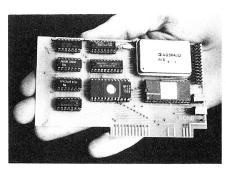


**Lewis Video Productions** 601 West End Avenue New York, N.Y. 10024 (212) 496-0223

Circle HelpCard No. 37

The Rainbo-256 is a Hi-Resolution analogue RGB interface card designed to interface from any Apple II computer to Electrohome, Taxan, and other similarly interfaced color video monitors. The video output is clean and distinct. Text output is pure white with no color hues. It is also programmable. It may be programmed for 256 individual colors by addressing 16 additional memory locations that the Rainbo-256 adds to the Apple. Specify monitor type \$279.00

Circle HelpCard No. 111 Microtek, Inc. 4750 Viewridge Avenue San Diego, CA 92123 (619) 569-0900



The PCS/2000 Networking Modem features auto-dial, auto-answer, Bell compatible 212A error-detecting and errorcorrecting communications for micro-tominicom puter communications. Contains a LCD clock and 32K file buffer that combine to permit unattended file transfer. Transmission and reception of information is even possible when the computer is turned off or while busy at another task. Remote, password protected, access of messages stored in the PCS/2000 is permitted from any ASCII terminal to protect against unauthorized data use. Complete with two RS-232 ports and local communications at speeds up to 9600 bps. Supported by MICRO/Courier software for the Apple /// and TRS-80.

Circle HelpCard No. 104 Microcom 1400A Providence Highway Norwood, MA 02062 (617) 762-9310



The Hayes Mach III and Mach III joysticks provide the greatest precision and accuracy, more features and longer life cycles. Both have coordinated 360 degree cursor control with fine trim adjustments on both axes, and a self centering feature

which can be externally disengaged to allow for positive true positioning movement. In addition, the Mach III joystick is constructed with a stainless steel ball as its main pivot and offers a push button switch on the stick handle to give the competitive edge for games, business and graphics applications. The Mach II is \$39.95 (Apple II), \$44.95 (Apple //e, IBM-PC). The Mach III for \$49.94 (Apple II), \$54.95 (Apple //e, IBM-PC). Circle HelpCard No. 108 **Hayes Products** 1558 Osage Street San Marcos, CA 92069 (619) 744-8546

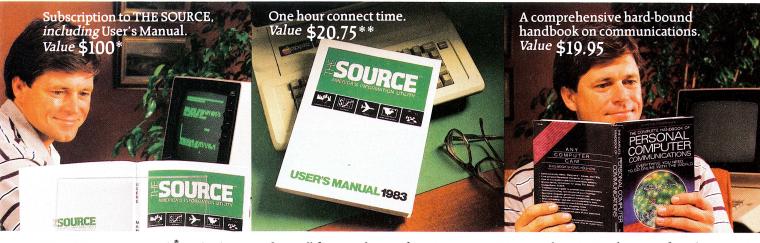
This new printer interface has both serial and parallel interfaces on a single card. It allows Apple II and Franklin Ace computers to be connected to local and remote printers, display terminals, modems and other computers and accessories. The parallel interface provides direct connection to Centronics compatible printers. It accommodates most parallel-mode dot matrix printers and may also be used for other accessories. The Serial Interface is the standard RS-232C operating from 45.5 to 389,400 bps. Includes switches for programming RS232C control signal options, eliminating the need for special cabling in many installations. The serial data format can be selected using the computer keyboard. Menu showing choice of speeds, character lengths and parity and stop bit options, can be displayed on the user's monitor. \$299.00.

Circle HelpCard No. 102 Franklin Computer Corporation 2128 Route 38 Cherry Hill, NJ 08002 (609) 482-5900



The EPS Keyboard is now Apple //e compatible. Plug-in modules reconfigure the keyboard for popular software packages, virtually eliminating complex command sequences. 12 Special Function Keys give up to 48 commands for popular software packages when used with these modules. Modules are available for WordStar, VisiCalc, AppleWriter II, dBASE II, Pascal and other packages. Unit comes with special BASIC and DOS commands which saves keystrokes. Interface board plugs into keyboard socket on motherboard - no

# Buy Micromodem IIe with Smartcom I software right now, and get this \$140 value FREE!



their toll-free number. And you're already well on your way to getting on-line!

It frees up your time. This offer also entitles you to \$20.75 worth of connect time—at no charge. Use it as you please! Check the latest news and sports. Look up your flight schedule. View your stock portfolio. You name it. The time is yours! Sixty minutes worth, or

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assembled the most comprehensive programs avail-

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cations. From games to commodity news. Electronic mail to teleconferencing. Discount shopping to abstracts of articles from business magazines. And everything you need to know is right there in your comprehensive, illustrated User's Manual. It's included with your free membership to THE SOURCE during this special, limited time offer from Hayes.

Plus the last word on communications. Now here's a book that delivers what it promises! In Alfred Glossbrenner's best seller, THE COMPLETE HANDBOOK OF PERSONAL COMPUTER COMMUNICATIONS, you'll find a thorough, informative

study of microcomputer communications. Worth every cent of the \$19.95 this hard-

bound book sells for. And yours absolutely free! *If you act now!* See your dealer soon. Buy Micromodem IIe with Smartcom I, and get the best telecomputing system for your Apple. *Plus* a \$140 value FREE. Hayes Microcomputer Products, Inc.

5923 Peachtree Industrial Blvd., Norcross, Georgia 30092. 404/449-8791.

Between Nov. 1-Jan. 15, you and your Apple can make the big break. From isolated desktop computing. To the exciting world of telecomputing. With Hayes Micromodem IIe and Smartcom I communications software. A complete telecomputing package for Apple II, III, IIe or Apple Plus computers. Let Micromodem IIe connect you, via telephone lines, to computers, terminals and information services all across America. Including THE SOURCE, AMERICA'S INFORMATION UTILITY.

This offer takes you right to THE SOURCE! And you won't have to pay to join! The same day you purchase your Micromodem IIe with Smartcom I, call THE SOURCE on

#### Here's all you have to do:

1. When you purchase your Micromodem IIe with Smartcom I, save your sales receipt and Hayes registration card (packed inside the box).

Pick up the phone and call THE SOURCE, on their toll-free number:

1-800-336-3366.

Tell THE SOURCE representative that you are participating in the special Hayes promotion, give the serial number of your Micromodem IIe (on the modem), and your credit card number (VISA, MasterCard, or American Express).† You will get your password to THE SOURCE, right on the spot!

Within a week you will receive an agreement from THE SOURCE, along with your New Member Kit. Sign the agreement, and return it within 10 days to THE SOURCE, along with your sales receipt for Micromodem Ile/Smartcom I, and Hayes registration card. Remember, send no money. Your membership is free!

That's all it takes! Look for your User's Manual and free communications book within two weeks of receipt of the agreement, sales receipt and registration card.

†THE SOURCE requires a major credit card for billing of hourly connect time to individual members. Corporate members may apply for direct billing.

\*Suggested retail price. \*\*60 minutes or more connect time, depending on the day and hour.

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Circle HelpCard No. 27

I/O slot is required. Includes a 6 ft. cord and telephone style jack to provide convenient placement and portability. 21-key numeric pad allows easy data entry. Works with any Apple II or Franklin computer \$349.95. Optional Softswitch allows added flexibility by enabling both the Apple and EPS keyboard to operate interchangeably. Modules are \$32.95 each. Circle HelpCard No. 109 Executive Peripheral Systems, Inc. 800 San Antonio Road

Palo Alto, CA 94303

(415) 856-2822

The Gorilla 12-inch Greenscreen monitor has crisp, clear images with a far denser dot pattern to give you easy-to-read text and vivid, extremely precise graphics. Special phosphors switch fast, yet glow evenly to prevent eyestrain due to flicker. Scrolling characters (or darting space ships) won't appear smeared or streaky. Built-in nonglare screen that reduces eyestrain and all the other related headaches that evolve from poor images. Features a minimum of 800 lines center resolution that will support up to 80 columns x 25 lines; Bandwidth is 22 MHz. Requires only 25 watts and weighs 14 lbs. Built-in tilt bracket lets the user adjust the monitor to a comfortable and convenient angle. Circle HelpCard No. 110

Leading Edge Products, Inc.

(800) 343-6833; (617) 828-8150 (MA)

225 Turnpike Street

Canton, MA 02021



The ComMander deluxe joystick controller is compatible with Apple and Franklin computers, and will be compatible with the IBM-PC and other computers in the near future. The contoured joystick has been designed electronically and ergonomically to give beginners and enthusiasts the ability to improve their skills and to play longer with less fatigue. They are designed for maximum performance by left- and right-handed players and the design blends with either computer or video game systems \$44.95. Features a single gimbal that actuates dual 100K potentiometers, one in each axis. Trimmable X and Y axes allow fine tuning of response.

Switchable self-centered or free-floating stick movements. Four discrete snap-action microswitch firing buttons have user-definable functions that permit personalized control. A coiled cord prevents wire tangle. The manufacturer also makes a less expensive standard controller for Atari and Commodore computers \$19.95 (right in photo). Circle HelpCard No. 112 Comrex International Inc. 3701 Skypark Drive Torrance, CA 90505



(213) 373-0280

The Digit-Ball is a 360 degree high-resolution digital computer input device that replaces awkward CRT touch-membranes. CRT light pens, digital mice, optical mice, etc. With its optional parallel interface card, the Digit-Ball is a direct replacement for joysticks and is 100% software compatible. Card allows for auto-centering and faster response time. Features X and Y quadrature encoding, cursor movement in direct proportion to ball movement in a full 360 degrees, 256 pulses (counts) per revolution (high or lower counts optional). Provided with 3 switch closures. With the Interface Card you can also auto center, sense ball position, program selections of centering positions for X and Y axis and move at dual speeds with 1:1 and 4:1 ratios for sensitivity/resolution.

Circle HelpCard No. 113 Interfirm Systems Corporation 1899 Montford Court San Jose, CA 95132 (408) 923-3338

The Operator 110/300 baud Direct Connect Modem for the Apple II computer plugs directly into telephone wall jack which eliminates audio noise pick-up related to acoustic couplers. Supports Pulse Dialing or Touch Tone. It is compatible with existing software and allows one way or simultaneous sending and receiving. No additional serial interface card is required. Features half and full duplex modes, auto-answer and auto-disconnect capabilities. Easy installation with immediate video displays from the modem. Everything is all on the interface card which fits into any slot (except 0). Includes a six-foot telephone cable with standard modular plug (RJ-11) for direct connection. Works with ASCII Express Pro, Data Capture, Modem Magic II, TermExec, Transcend I, II, and III, VisiTerm, Z-Term, and many more. Circle HelpCard No. 114 T.I.M.E.C.O.R P.O. Box 8928 Boston, MA 02114 (617) 720-4090

With the ECHO speech synthesizer. whatever you type on the keyboard, your computer can say. And now a diskette of fixed, natural sounding words is available to enhance the ECHO II's voice output. The ECHO's text-to-speech system gives your computer an unlimited vocabulary while using a minimum of memory. It contains nearly 400 language rules, which enable the computer to pronounce most correctly spelled words. When in the textto-speech mode the user can select any of 63 different pitch levels, and have words spoken either monotonically or with intonation by using simple control character sequences. The rate of speech can be fast or slow; words can be spoken in their entirety or spelled letter by letter. It also can pronounce punctuation and numbers. Optionally, words can be encoded using phonemes and diphthongs. Complete stand alone unit which is compatible with most any computer, Echo sells for \$299.95. The ECHO II, which plugs into the Apple II, is priced at \$149.95. Circle HelpCard No. 115 Street Electronics Corporation 1140 Mark Avenue Carpinteria, CA 93013 (805) 684-4593

#### **Printers/Plotters**

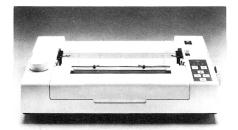
Now, even home computerists as well as personal computer users can afford to make professional-looking 4-color graphic printouts with the new \$695.00 Model CX **4800** printer/plotter. The resulting printouts can be extremely detailed: the pen can be moved in fine steps of 0.1 or 0.5 millimeter, less than the thickness of a fine-point ink line. Plotting is also relatively fast at up to 4.8 inches per second. Covers an effective area of up to 7.6" x 8". Color changes can be made automatically under command of the user's computer. Prints a standard 80 character line wth a character size of 2.4 x 1.6 mm at a printing speed of 8 characters per second. A total of 1677 key characters are available, including upper and lower case, letters, numbers, punctuation marks, graphic symbols and foreign alphabets. Printing and plotting can be intermixed on the same page. Uses both single or fan folded sheets of standard sprocket-feed paper. Circle HelpCard No. 116

Leading Edge Products, Inc.

225 Turnpike Street

Canton, MA 02021

(800) 343-6833; (617) 828-8150 (MA)



#### Miscellaneous Hardware

Model DX-1 Sound Processing System is a hardware/software package for the Apple II for recording, processing, and playing back real sound. The record and playback technique used is 8 bit A/D and D/A sampling. Though this technique offers limited sound duration (1 to 10 seconds), some amazing feats are accomplished with the software program. For example, one of the six software "menus" allows a collection of pre-recorded drum sounds to be played in real time on the Apple keyboard. Another provides "random" reproduction of real sounds. Other software menus enable the user to record and reproduce any sound, and include the ability to program variations in pitch, volume, and sequence. Sounds can be played in reverse if desired. Sounds recorded can also be saved on diskette. The printed circuit board will interface directly to any medium to low level signal source such as a microphone. The board output can drive a speaker either directly or through an amplifier. Sound reproduction quality is claimed to be "very good to excellent". Includes the printed circuit board, an operations manual, and a floppy diskette with effects and twenty-two pre-recorded sounds \$239.00.

Circle HelpCard No. 119 Decillionix P.O. Box 70985 Sunnyvale, CA 94086 (408) 732-7758; (408) 735-0410 (Demo)

The RS232 Analyzer allows for the easy diagnosis, monitoring and connection of any device or computer utilizing the RS232 interface. It monitors 9 signals and displays their status using bi-color LEDs. In this way inactive, high and low as well as changing signals can be monitored. An additional LED can be tied to any line. Switches allow for the easy interconnection of the most common computer-tocomputer interface, etc. Cross-wire any connection necessary to connect devices. It may be left permanently wired in any circuit. The manual contains a detailed example of using the RS232 Analyzer to hook up a computer and intelligent printer \$149.95.

Circle HelpCard No. 117 Personal Computer Products 1400 Coleman Avenue, Suite C-18 Santa Clara, CA 95050 (408) 988-0164



VideoSlide35 computer graphics camera system enables personal computer and graphics workstations users to produce high quality color 35mm slides. A new 24 kilohertz line rate version, which is required by such recently announced systems as the Apple Lisa, the NEC Ad-

vanced Personal Computer, the Vectrix 128 and 384 display systems, etc. The original VideoSlide35 is compatible with systems requiring between 15 and 19 kHz line rates, such as Apple II, IBM-PC, etc. Both versions allow users to obtain 35mm color slides at a cost of less than 50 cents a slide. in as little as one-half hour, from images generated by their personal computers and color terminals. The 24 kHz Video-Slide35 is available for \$3,049, which includes the complete camera unit and a TTL RGB video interface. The original VideoSlide 35 is priced from \$2,799.

Circle HelpCard No. 118 Lang Systems, Inc.

**OPEN AND SHUT CASE** 

PROTECTING YOUR APPLE...



Circle HelpCard No. 35



1010 O7Brien Drive Menlo Park, CA 94025 (415) 328-5555

Applescope Digital Storage Oscilloscope and Data Acquisition System uses the CRT monitor to graph the digitized input signals on a 280 x 160 dot grid with an additional three lines of text at the bottom of the screen used to display the current settings. These three text lines include all of the trace parameters which would be read off the front panel of a standard oscilloscope wth some notable additions. Applescope can acquire up to 64 screen displays for each sweep in the DMA mode. The monitor display is only a window which can be scrolled through the acquired signal trace. Features high speed A/D inputs, 8 bit or 14 bit resolution, single sweep or continuous trace, external trigger capability, 4 channel software support, waveform storage on disk, pretrigger viewing, hardcopy output. Scope Driver Library offers data analysis software: Spectrum Analyzer, Pulse Rate Meter, Interspike Interval Histogram, Frequency Meter, Transient Recorder, Digital Voltmeter, Chart Recorder, Signal Averager, Time Interval/Latency Mesurement and Autocorrelator. Configure your Applescope system to automate your test and experiment procedures creating a personalized data acquisition system. Complete with hardware, Scope Driver software, Reference Manual, external trigger and BNC input connector. Some Scope Driver software is at additional cost. Basic dual channel system \$795.00 to \$995.00, probes \$45.00, Demonstration Diskette \$10.00.

Circle HelpCard No. 120 R.C. Electronics, Inc. 5386-D Hollister Avenue Santa Barbara, CA 93111 (805) 964-6708



B.O.B. is a fully expandable personal robot designed to entertain, communicate and be a useful addition to the home environment. B.O.B.s on-board "native intelligence" derives from Intel 8086 microprocessors combined with 3-megabytes of memory capacity. The robot will navigate a living space and talk in a humanlike voice, randomly choosing over one hundred stored words and phrases. Infrared sensors attract B.O.B. to humans.

whom he may follow at will; in the process, he'll avoid inanimate objects in his path via his ultrasonic sensing devices. One additional feature of note: B.O.B. can retrieve a beer or softdrink from an optional AndroFridge, and bring it to wherever his master may be waiting. (At least it has its priorities straight!—PCW.) It is able to accommodate a range of additional cartridges and plug-in boards, such as those for memory and CPU expansion, as well as for specific functions (i.e., voice recognition or text-to-speech modules). Includes a high-level program language. Optional Androwagon attaches to the robot's midsection enabling it to transport books, beverages or the baby's diapers from room to room. B.O.B. \$2,995.00, AndroWagon \$95.00.

Circle HelpCard No. 121 Androbot, Inc. (213) 462-3539



Now you can have full IBM communications capability through one of innovative Data Technology's 1/2-inch magnetic tape peripherals. Featuring industry-standard interfaces, rapid data transfer rates, full operating and command subsets and a wide selection of models and configurations, IDT's magnetic tape subsystems provide economical and reliable data/program interchange, 40M bytes of storage and disk back-up. All subsystems come complete and include tape transport, formatter, intelligent controller, computer resident coupler, cables, documentation and software.

Circle HelpCard No. 122 Innovative Data Technology 4060 Morena Blvd. San Diego, CA 92117 (619) 270-3990

Many of the best hardware and software products on the market today are compatible with Thunderclock Plus, because Thunderclock Plus makes them much more versatile. Just plug Thunderclock Plus into your Apple II, //e or /// and it can do any number of tasks automatically. In the office, the lab or at home. For instance,

with business or communications software, your Apple can access a data base or send electronic mail when the rates are lowest. Thunderclock Plus can also time and date stamp your disk files to the minute, time experiments and even water your lawn. But that's just the start. No matter how you use your system now, it can work much more efficiently with Thunderclock Plus. On-board batteries keep it running accurately for up to four years without battery replacement.

Circle HelpCard No. 123 Thunderware, Inc. 44 Hermosa Avenue Oakland, CA 94618 (415) 652-1737

Replay II is an Apple program copy and development system. Users can stop a program, examine and change memory, or copy the program, and restart. Control of the Apple is obtained by pressing the remote switch which comes on an 18 inch cord outside the Apple. Replay II does not copy the original disk, rather it copies the program executing in memory. Replay II does not change any memory. Extra memory is buffered to allow copying and analysis without altering the original memory contents. Standard DOS 3.3 files are created automatically for storage on floppy or hard disks. A RAM card is needed for this. Fully documented in a 60 page manual. Utility programs supplied with the Replay II card include Program Analysis, Comparisons, Packing and Compression. It can automatically move protected Applesoft programs to a standard DOS 3.3 disk for listing or modification. Save a game at any level and quickly restart with this card. Users can freeze games, change variables to obtain unlimited ships or power, etc., then restart the program \$130.00

Circle HelpCard No. 124 Micro-Analyst, Inc. P.O. Box 15003 Austin, TX 78761 (512) 926-4527

No longer do computer game players and programmers have to worry about disturbing their families or roommates with the beeps and buzzes of computers. The Whisper Volume Control is an easy to install plug-in unit which allows the Apple or IBM-PC computer owner to regulate the sound level of his personal computer. The Whisper Volume Control is a compact 3.5 inch x 2.5 inch x 2.25 inch unit. It plugs directly into the main board, so it does not require a slot or game port. Also available is a model with a standard headphone jack for complete listening privacy. Cost is \$22.95 or \$25.95 with additional headphone jack.

Circle HelpCard No. 125 Information Dynamics Corp. 1251 Exchange Drive Richardson, TX 75081

The MetaCard co-processing system for any Apple II or look-alike includes an 8088 microprocessor operating at 5.12 MHz, 64K (\$850.00) to 128K (\$980.00) of onboard memory with parity, and its own external power supply. It allows many of the software applications for the IBM-PC to run on your Apple, plus it enables continued use of your existing Apple peripherals and software. Both Microsoft's MS-DOS and SofTech Microsystems' UCSD p-System Version IV.1 operating systems come standard with MetaCard, plus Digital Research's CP/M-86 operating system is available separately. The manufacturer also provides a variety of hardware and software products to complement MetaCard.

Circle HelpCard No. 128 Metamorphic Systems, Inc. 8950 Villa La Jolla Drive, Suite 1200 La Jolla, CA 92037 (619) 457-3870 (CA); (800) 228-8088

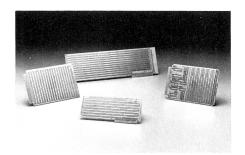
Three new lab interfaces are available for Apple computers - Heat, Light and Sound. These interfaces can be used for classroom physics experiments. Each package contains a kit of parts that can be plugged into the game connector, a disk for calibration, and documentation for several experiments. Light Experiments include timing a pendulum, measuring the acceleration of gravity, measuring light intensity, and the efficiency of a light bulb. Four phototransistors are included. Heat experiments include graphing temperature vs time, thermal radiation, cooling curves, and specific heat. Four thermistors are included. Sound experiments include sound intensity, simulated oscilloscope, and Fourier spectrum analyzer. A speaker, microphone, potentiometer, transistors and a capacitor are included. Each is \$60.00.

Circle HelpCard No. 126 Cross Educational Software 1802 N. Trenton Street P.O. Box 1536 Ruston, LA 71270 (318) 255-8921

605 Old County Road San Carlos, CA 94070 (415) 592-2740

Artec Electronics, Inc.

Individuals who are designing cards for the Apple, IBM-PC and STD BUS will find it easier to develop and use the Artec breadboards because the layout of the I/ O area is less complicated. Each breadboard is manufactured to Artec's high standard of quality. The boards feature FR4 glass epoxy, plated-through holes, reflow solder-plated circuitry, and nickel/ gold-plated connector fingers. The price of the breadboards are \$12.00 for the Apple or STD BUS boards and \$30.00 for the IBM-PC board. They also carry other perforated boards, and associated items. Circle HelpCard No. 127



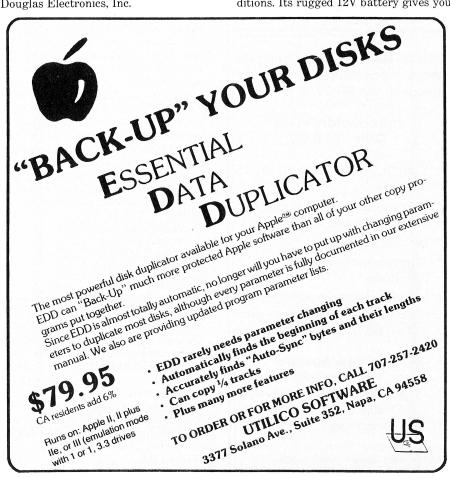
Designed for use in systems where use of a full Apple computer may not be necessary or desired, the Appleseed bus system allows you to make use of almost every plug-in board available for the Apple II without requiring you to be committed to use an Apple, Franklin or similar computer with its built-in keyboard, consumer oriented packaging, and graphics subsystems. Now you can design a system using an Apple II and then market it using Appleseed Bus products. The Appleseed CPU, RAM, and PROM boards are valuable tools to debug standard Apple II computers. Simply insert the CPU board into any slot in an Apple II motherboard; the 6502 on the mother board will be defeated and the Appleseed CPU will be in control of the computer. They also carry extender boards and general purpose breadboard and wire-wrap panels.

Circle HelpCard No. 129 Douglas Electronics, Inc. 718 Mariana Blvd. San Leandro, CA 94577 (415) 483-8770

Multiport Controll is a code activated one to four serial port expander. Features separate and independent USRTS, buffers and handshaking. Each port can operate with a different configuration, i.e. different baud rates, stop bits, etc. These features also permit two or more devices to communicate with the Model 524 simultaneously. Provides full duplex with EIA RS-232 protocol, baud rates up to 19,200, expansion to 16 ports by cascading, peripheral ports may be configured by user software. Includes a one year warranty \$249.00. Model 524A has 256 byte rx/tx buffers per port \$279.00. Model 524D adds continuous polling of each peripheral device for data transfer requests. On, Busy. and Off messages are sent to the peripheral device.

Circle HelpCard No. 130 Bay Technical Associates, Inc. Highway 603 P.O. Box 387 Bay St. Louis, MS 39520 (601) 467-8231

Guardian Angel uninterruptable power source switches to 150 watts of backup power in 1/100th of a second or less while alerting you of blackout or brownout conditions. Its rugged 12V battery gives you



Circle HelpCard No. 68





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Circle HelpCard No. 7

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- Simple to use--learn in 15 minutes
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Circle HelpCard No. 45

up to six minutes (15 at half-rated power), enough to save your data and shut down your system if line power does not return. Its transient voltage suppressor also prevents system damage from power spikes. It simply plugs in between your power source and your microcomputer. Its compact size permits either desktop use or out of the way placement.

Circle HelpCard No. 131 R.H. Electronics 566 Irelan Street Buellton, CA 93427 (805) 688-2047

Finger Print turns an ordinary Epson printer into a more versatile, harder working, problem solving match for your computer. It is a plug-in module that puts 10 special print functions at your fingertips. Tap your printer's panel buttons to instantly select the functions you need. Features compressed, double-sized, emphasized print, perforation skipover, italics, fine print, etc. Works with MX80/100, MX & FX/RX or IBM-PC printer \$59.95. Circle HelpCard No. 132

**Dresselhous Computer Products** 837 E. Alosta Avenue Glendora, CA 91740

(800) 835-2246 ext 441; (213) 914-5831 (CA)

Get a head start in robotics. Try the Tasman Turtle, an inexpensive and easy to control mobile robot, which allows you to explore all the concepts of robotics. Tasman moves, turns, draws, beeps, blinks and "feels" with its touch sensors - it can even talk with the addition of an optional speech board. From the novice programmer to the artificial intelligence expert, Tasman Turtles provide a fun way to try out even the most sophisticated robotics concepts. Easy to control in BASIC, LOGO or any other high-level programming language, Tasman Turtles come complete with software and documentation, power supply and interface. Available in both Apple and RS-232 port versions from \$299.95.

Circle HelpCard No. 133 Harvard Associates, Inc. 260 Beacon Street Somerville, MA 02143 (617) 492-0660

The Fan is a single unit with a very quiet and efficient cooling fan. It has all the necessary connectors and fits neatly on the back of your Apple. It also filters out surges and spikes in the main supply which can damage your hardware and corrupt data. A single switch ensures that all peripherals are turned off at the same time as the Apple II. Includes connectors for disk drives, tape outputs, monitor or TV and other external peripherals. \$155.00.

Circle HelpCard No. 134

Hiteck USA

111 East Drake, Suite 7061 Fort Collins, CO 80525

#### SOFTWARE

#### **Business** (General)

DISPATCH, an order processing system for the mail order industry, is now available on microcomputers. Designed to simplify mail order fulfillment, DISPATCH utilizes a unique perforated multi-purpose form which incorporates two mailing labels, a packing list showing products and financial summary, a VISA/MasterCard sales draft, and a refund check or credit memo. It maintains inventory records, supports on-line customer service, and produces marketing reports about source codes, back order, and inventory. Back orders are maintained automatically. The system also contains mailing list and accounting functions. Runs on CP/M and MS-DOS systems with 64K. Requires two floppy drives or a hard disk, as well as an 80 column screen.

Circle HelpCard No. 135 Professional Publications, Inc. P.O. Box 199 San Carlos, CA 94070 (415) 593-9119

Client Organizer is a business address book, an appointment calendar and a mail list organizer. This system stores information about a client in a format that is easy to read and logical. The information consists of company name, address, phone number, the name of the contact at the client's office and information about the contact. Date and time of appointments can be entered as can any information regarding the client. Each file holds up to 100 individual client records with 15 vital fields per record. Features user friend ly data entry with easy editing capabilities. It informs the user of appointments with precise date and time with minimum keyboard interaction. Produces screen or hard copy printout for all records, mail list labels with three options and variable line separations between labels. Written specifically for use on Apple II computers with 80 column cards. \$99.99 suggested retail.

Circle HelpCard No. 136 Great Divide Software, Inc. 7475 West 5th Avenue, Suite 303 Lakewood, CO 80226 (303) 238-5258

BRAINSTORMER is a powerful software tool for generating potential solutions to complex problems. It works by building a description of a problem in terms of the themes and variations which affect its solution. The description of the problem is "probed" by the program to generate ideas about potential solutions to the problem. The user refines the process by controlling the occurrence of particular themes and variations until a sufficient quantity of potential solution strategies is produced. Up to ten billion "idea probes" can be generated for any user specified problem. Potential applications include: increasing flexible thinking, discovering new products, targeting new markets and exploring organizational problems. Requires CP/M on the Apple II \$50.00. Includes a User's Guide and example files. A program with concurrent group license for 2-10 machines used by a single organization costs \$100.00.

Circle HelpCard No. 137 Soft Path Systems C/O Cheshire House 105 North Adams Eugene, OR 97402 (503) 342-3439



The Pharmacist's Assistant is designed to handle all of the prescriptions, billing and inventory of a pharmacy. The initial release of the package is designed to work with any Apple II and a hard disk drive. With a 5MB hard disk drive The Pharmacist's Assistant has the capacity to handle 16,000 prescriptions, 6,000 inventory items, 10,000 customers, 200 doctors and up to 10 prerogrammed Special Billing Plans. With a 10MB hard disk these numbers double. The program prints all prescription labels, keeps track of reorders, handles all welfare and insurance billing, provides management reports, and allows rapid price updating. The program has been designed for ease of operation, is fully menu driven and will also handle the special needs of nursing home prescriptions. Optional bi-weekly disk update to keep up with rapid price changes.

Circle HelpCard No. 138 Superex Business Software 151 Ludlow Street Yonkers, NY 10705 (914) 965-1469

Query! General Database Management System permits the user to create as many as 255 fields with 255 characters each. The Printer routine permits the user to select many new options in sending records to the printer. Labels can now be printed from 1 to 4 across the page, allowing the use of 4 up label sheets. Select continuous feed or single sheet operation or stop the printing by pressing any key and continue printing by pressing «RETURN». The View program allows the user to send the current record to the printer

in any of the formats. Sort will alphabetize 500 records of 100 characters each in one minute and four seconds. Search using logical combinations of AND's and OR's with \{,\}, = substring or first character comparisons. Five HELP menus provide on-line assistance . Includes manual \$29.95.

Circle HelpCard No. 139 Hoyle & Hoyle Software, Inc. 716 S. Elam Avenue Greensboro, NC 27403 (919) 378-1050

Decision Series for the Apple II includes Land Lease and Feeder Cattle. Uses sophisticated "what if?" features to give the farmer immediate analysis of changes in any input value. Reporting options include Profit Statements, Cost/Profit Tables and "what if?" Analysis Reports. The programs also print out input sheets to make data compilation easy. The Feeder Cattle program can be used for any type of feeder cattle purchase,

regardless of weights or feeding program. Several different price and cost levels can be evaluated simultaneously \$80.00. Land Lease evaluates both the tenant's and land lord's side of the picture for several types of leases. These lease options include crop share, fixed cash rent, custom incentive leasing, and variable cash rents. As such it can prove useful to both land owners and renters, lenders, and extension agents \$80.00.

Circle HelpCard No. 140 Harvest Computer Systems 102 S. Harrison Street Alexandria, IN 46001 (317) 724-9527

Daisy Professional, now available for the Apple II Plus and Apple //e, is a new and enhanced version of Statistics with Daisy, which performs over 50 statistical functions overall, including: Basic Descriptive Statistics, Correlations, Nonparametric Statistics, Hypothesis Testing, Data Transformations,

#### NEW! EXTENDED PROTECTION AGAINST SPIKES, SURGES AND LINE NOISE!



#### SCOOTER's new XP-4 GUARD-IT™ CONTROL CENTER with state-of-the art fail-safe design.

SCOOTER's new XP-4 GUARD-IT CONTROL CENTER features electronic components and design so advanced it eliminates the possibility of surge damage (both normal and common mode) to your equipment and programs. Plus it filters line noise and functions as a oneswitch control center.

Here's how it works: Combining a new surge protection with solid state devices, SCOOTER's XP-4 reduces spikes as high as 6000 amps and filters line noise. In the unlikely event of filter module failure due to repeated surge hits, the XP-4's fail-safe design goes to work blocking all unprotected power to your equipment. But the XP-4 filtering modules are so reliable, the unit has an extended three-year protection warranty against failure.

Ask your local computer supply source for SCOOTER's new XP-4 GUARD-IT CONTROL CENTER. Get fail-safe extended protection for your expensive equipment and valuable programs now!

SPECIFICATIONS:

- Rated at 15 amps. 125 volts
- Maximum spike current: 6000 amps (8x20 ms)
- Clamping spike voltage: 225 (lpk = 100 amps; 8x20 ms)
- Let-through voltage: 400
- Pulse life: 108 cycles
- Pulse life: 108 cycles
   Noise filtering: more than 20 db, 2-100 mhz
- Power indicator light
- Push-to-reset circuit breaker
- Heavy duty 6-ft. grounded cord
- 4 protected outlets
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Other SCOOTER products include: cable assemblies, connectors, flat cable, semiconductors, switches, surge protected outlet strips, integrated circuits & sockets and electronic components & hardware.

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ohm/electronics AO-983 746 Vermont St., Palatine IL 60067 Regression Analysis, and produces seven different screen plots and graphs. It also allows for missing data and cross tabula tions. You can transfer data to and from VisiCalc, VisiPlot, DB Master, Multiplan and General Manager. There is also a utility that sends data from mini and mainframe computers to your Apple for processing. Optionally uses an 80-column board or a 132 column Ultraterm board, 128K RAM card and the special function keys of the Apple IIe; yet it is fully compatible with the 48K or 64K Apple II Plus.

Circle HelpCard No. 141 Rainbow Computing, Inc. 9719 Reseda Blvd. Northridge, CA 91324 (213) 349-0300

FilePro is a top-notch database file manager with a strong family resemblance to its popular predecessors. It was created for the non-programmer who wants to set up a mailing list or a customer account file within a single work day. Files can be quickly constructed by even novice users thanks, in part, to the handholding tutorial approach to documentation. Similarly, reports and label formats can be painlessly custom designed \$300 plus \$10 shipping and handling. Requires any Apple II with CP/M. A catalog of other products is available upon request.

Circle HelpCard No. 142
The Small Computer Company

230 West 41st Street, Suite 1200 New York, NY 10036 (212) 398-9290

MEDI/FORM-83 and PCC/FORM-83 are new programs designed to make a pharmacist's life much easier than it could be before. The programs store patient data, doctor data (MEDI/FORM-83 only), and drug data that normally the pharmacist would have to look up manually. They then use this information to print the forms necessary to have a prescription or MediCal claim processed. The programs (sold separately) are priced so that the corner pharmacist can afford them, and they can pay for themselves inside of six months through lower labor requirements. Statement Printer computes the charges. Each program is

Circle HelpCard No. 143 Vertical Software Group P. O. Box 16284 Long Beach, CA 90806 (2139 427-7225

\$399.00. Requires any Apple II

An Invoicing Application Template is available for the VersaForm Business Form Processor/Database. The template is the third in a series offering screen formats, form print formats and report instructions for configuring VersaForm to specific applications. The templates, in conjunction with VersaForm, will check data entered for accuracy, automatically extend prices from quantity

and unit prices, figure sales taxes and invoice total charges. Customer payments are automatically subtracted from invoice amounts to show current balance due. The template may be modified by the customer to use VersaForm's look up tables and list check features. A starter set of business forms are included in the package along with form ordering information. It you have a preferred invoice form, the template can be modified to print onto it. \$49.95.

Circle HelpCard No. 144 Applied Software Technology 170 Knowles Drive Los Gatos, CA 95030 (408) 370-2662

VisiCalc Formatting Aids 4.5 adds print-using to the earlier features of printing variable width columns, formula reading and file handling. The new global features are as easy as selecting from a menu. No more pasting or retyping. Reads files just as VisiCalc does, but instead of taking up memory for calculating power, it is dedicated solely to file handling and report formatting. In fact, it can process huge files created on expansion RAM boards quickly and easily. Provides floating \$ sign, commas, and parentheses. For any Apple II or the Apple ///.

Circle HelpCard No. 145 Data Security Concepts P.O. Box 31044 Des Peres, MO 63131 (314) 965-5044

#### Communications

RTTY Machine is designed to minimize the interface hardware. Audio tones fed into the Apple cassette input will be demodulated and decoded in software, and sent to the screen as text. Keyboard input will be encoded to Baudot and sent to the cassete output as MARK (2125 Hz) and SPACE (2295 Hz) tones. All that is necessary to run standard TTY is a pair of audio cables with the necessary connectors be tween the speaker output and microphone input of an SSB or FM transceiver and the cassette ports of the Apple. Two modes are offered: absolute for AFSK and a second mode that can be used to match the software discriminator frequency to the center of the receiver audio passband so that increased selectivity may be used. Transmits key by key or pre-edited messages. D.C. output through the Game I/O connector is available to drive frequency shift keying circuitry and transmit/receive switching. Two printer drivers are included. For any Apple II using DOS 3.3. Diskette and full instructions included \$29.95.

Circle HelpCard No. 147 COTEC 13462 Hammons Avenue Saratoga, CA 95070

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Systems include the complete KJV Bible text on disks. THE WORD processor can search the Scriptures for any word or phrase. Any portion of the Bible can be printed or displayed. Create your own library of research materials or use ours, called TOPICS.



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Circle HelpCard No. 6

# APPLE MODEM. WITH EVERYTHING.

Your best buy in modem history. The **Networker**, a plug-in single-slot direct connect modem for your Apple II, II+, and IIe (or Franklin, Albert, or other Apple compatible computer). You are immediately linked to the vast network of computers—data bases like the Source, Compuserve, or Dow Jones, friends, banks, businesses, and hundreds of local ''bulletin boards.'' For only \$129. There's absolutely nothing else to buy. And it even comes with software.

This is the modem that does it all, and does it for less. The Apple Communications Card is on board, so you won't need to buy one. That will save a bunch. It's 300 baud, the most commonly used type of modem. It comes complete with its own communications software on Apple compatible disk, giving you features *no* modem offers.

Like "'data capture" to lock the messages into your Apples' RAM, and then move the information onto a disk for easy reference and review. A terminal program that turns your computer into a communications command center, displaying on-screen "help" menus, continuous updates of memory usage, carrier presence, baud rate, communications status, all while taking in and displaying information from any computer.

The **Networker** supports both originate and answer modes, so you can send and receive information, in full or half duplex modes. And its all easily programmable right from the keyboard of your Apple computer. All you do is plug **Networker** into any slot (except 0) in your Apple computer. It'll even ask you what slot it's in. It's that easy to use.

\$129

#### NETMASTER™ COMMUNICATIONS SOFTWARE

For \$179 we include the even more incredible **Netmaster** software for advanced users. **Netmaster** is a 'communications freeway' that lets you speed any Apple file to another Apple through noisy phone lines, without errors. **Netmaster** even includes its own Disk Operating System to control the flow of information and leave you over 40K of 'buffer' memory from your 64K RAM. And there's always help when you want it. On screen. Status indicators keep you fully updated.

**Netmaster** will let you transfer games, computer graphics, programs, sales reports, documents, any DOS 3.3 file, all directly from disk to disk, all with computer (not telephone) accuracy. **Netmaster** is completely configurable to understand any computer, even mainframes. File size is unlimited.

But **Netmaster** is not stuffy. It will talk to the other communications packages like Visiterm® or ASCII Express® Of course they don't support **Netmaster's** superb error checking, that guarantees you won't miss even a comma. It doesn't only talk to the Networker either. It will also talk to those more expensive modems from Haves and Novation.

And **Netmaster** is fast. It transfers information disk to disk three to five times faster than the others. Of course **Netmaster** is fully compatible with them. But if you want things to happen really fast, talk to another Netmaster.

We sell **Netmaster** by itself for \$79, and even if you have another modem for your Apple, **Netmaster** is an outstanding value. It will even support auto dial and auto answer. **Netmaster** requires 48K of Apple memory, disk drive and DOS 3.3, and Z00M's **Networker** modem or another modem. It can also be used without a modem when two Apples are hardwired together, using a 6850 or 6551-based interface card.

Networker, Netmaster, and Networker/ Netmaster combo are all produced in the USA by ZOOM Telephonics, producers of the popular DEMON DIALER. The Networker is FCC registered, and all products come with a one-year warranty.

#### HOW DO I GET ONE? OR TWO?

Check with your computer dealer. Or call us direct at 1-800-631-3116, and we'll let you know where to get them in your area.

Massachusetts residents call 617-423-1288.

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Hello, Central! supports communications with other computers, dial-up information services, computer bulletin board systems, and electronic mail systems. It also permits uploading and down loading of programs, and offers a built-in text editor. A well-illustrated program manual recommends user reponses in a variety of situations. Sample screens are shown and appropriate command keys are highlighted in the manual's simple approach. Requires an Apple II with DOS 3.3, 48K and one disk drive and acoustic coupler or direct-connect modem \$99.95. Circle HelpCard No. 146 Howard W. Sams & Co., Inc. 4300 West 62nd Street Indianapolis, IN 46268 (317) 298-5400



Net-Works II is an electronic bulletin board that automatically answers and records each phone call. Asks for the caller's password or assigns one to the first-time caller. The system operator may screen the caller prior to password validation, or even charge a membership fee. Eight "General Interest" bulletin board topics can be customized as you desire. Provides a "welcome" message and "help" information for new callers. "Expert" callers see fewer menus and instructions. Callers may send private mail to each other, post or read public bulletins, receive programs or text files, and view the membership list. Requires a 48K Apple II or Franklin Ace, Micromodem II, one disk drive and monitor. Optional hardware includes a clock, second disk drive, printer, hard disk drive, reserve power supply. Upper/lower case, and 40/80 column video capabilities are supported \$99.00.

Circle HelpCard No. 148 High Technology Software Products, Inc. 1611 N.W. 23rd Street Oklahoma City, OK 73146 (405) 524-4359

#### **Educational**

**Teacher's Apple** is a grade tracking program for teachers that tracks up to 50

Pack your Apple.



to tote your Apple II® from home to office or classroom. This attractive, dark tan case is weatherproof, padded and lined for extra protection. Features exterior pockets for two disk drives, an interior pouch for diskettes, and safety handle and shoulder strap for ease in transporting your computer. Suggested retail price \$39.95.

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**Trans Western Industries, Inc.** 31619 10th Ave. South Federal Way, WA 98003

Dealers call (206) 941-0888 or (206) 941-3473 Telex 152450

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Circle HelpCard No. 66

students with up to 200 assignments per student. An assignment consists of an assignment name, assignment number, points possible, points received, and the date of the assignment. It will print the assignments in many formats; highest to lowest grade, grade book column format, just percentages, any range of assign ents, and complete printouts. Optionally, the data may be printed on the screen or the printer. Includes an editor to change data that has been entered incorrectly \$34.95.

Circle HelpCard No. 149 Simple Software Systems P.O. Box 41069 San Jose, CA 95160

**Decimals** is an interactive software program aimed at the able elementary student, the regular junior high student, the high school student applying decimals in the science laboratory, or the remedial community college student. The eight topics in Decimals each contain two programs. The "A" programs provide an interactive inquiry into a topic that lets the student give the computer problems to solve and then in turn presents practice problems given by the computer. The "B" programs are enrichment extensions of the concepts presented in the "A" programs, often in a game format. The final "B" program is a review test for the en-tire

Circle HelpCard No. 150 Quality Educational Designs P.O. Box 12486 Portland, OR 97212-0486 (503) 287-8137

**MasterType** allows each user to develop mastery of the keyboard at an individual rate through 18 progressive lessons. Each row of keys is separately introduced, presenting individual keys first, and building up to words. After each lesson, a report indicates the number of words typed per minute and words misspelled or destroyed. For individuals who want to experiment in creating their own lessons, a Make Lesson feature is provided. It allows users to program custom spelling and vocabulary games as well as keyboard practice exercises. The package includes a manual that contains directions for running the program, descriptions of the options and their educational implications, hints for winning the game, finger charts for the keyboard, suggestions for successful touch-typing, directions for customized lessons, and descriptions of the 18 preprogrammed lessons \$49.95. Requires any Apple II with 48K and DOS 3.3.

Circle HelpCard No. 151 Lightning Software P.O. Box 11725 Palo Alto, CA 94306 (415) 327-3280

**Sound Training** is audio cassette based instruction in the use of major software

packages for microcomputers. Available for WordStar, MailMerge, CP/M. Additional topics will be available shortly. A special feature of these training kits is their adaptability to any microcomputer using the relevant sotfware package. Each kit is price at \$69.95.

Circle HelpCard No. 152 Information System Resources, Inc. 1444 Balsam Street St. Paul, MN 55122 (612) 452-7913

Participative Management Skill is a computer-based training program designed for managers, supervisors, or team leaders. Objectives of the program are to provide participants with the techniques and skills they need to: build a participative work environment; communicate effectively with team members and other company members; develop and utilize the problem solving skills of all team members; improve employee job satisfaction; increase product/service quality and productivity and create a teamwork environment. Participative Management Skills is designed for use with any Apple II or IBM-PC computer. It consists of an instructional text and the necessary computer software

Circle HelpCard No. 153 Concourse 2626 East 82nd Street, Suite 215 Minneapolis, MN 55420 (612) 854-8848

No need for a dusty chalkboard when you have Apple Function Explorer: Understanding the Sense and Shape of Equations. This function plotting tutorial is designed to help students understand the relationship between graph and equation. The computer turns the drudgery of practicing graphing into a challenging and entertaining experience. Students will find it helpful in pre-calculus courses such as Algebra and Trigonometry. The disk contains programs for use both in the Cartesian and polar coordinate systems. Equations of your choice can be entered and plotted. Two or more can be plotted on the same graphic screen, permitting the student to see how, when equations are superimposed upon each other, the resulting curve's appearance changes drastically. A 16-page manual is included \$36.00 plus \$1.80 P&H. A School License Agreement (includes 3 copies of the program and 6 manuals) is available for \$76.00. Additional student manuals are \$2.00 each.

Circle HelpCard No. 154 K-12 MicroMedia 172 Broadway Woodcliff Lake, NJ 07675

Managerial Finance in Action is a new interactive learning course for the Apple II which will teach you the language of finance and accounting; how to interpret and use financial reports and statements; how to improve your business decisions

and financial well-being; how to measure profit, evaluate your financial condition, and judge your business performance; how to communicate better with financial specialists; and how to use your Apple as a financial tool. A series of audio cassettes explains and guides you through ten computer diskettes. Includes over 120 pages of text, exercises and work sheets, 10 floppy 5.25-inch diskettes, 5 audio tape cassettes, a 3-ring binder and 90 day warranty. Your Apple computer produces and controls text with complete graphics, makes computations with you, compares your exercises to the correct responses and then patiently shows you how to make adjustments and corrections \$375.00 plus \$4.95 P&H. Requires any Apple II with 48K and DOS 3.3.

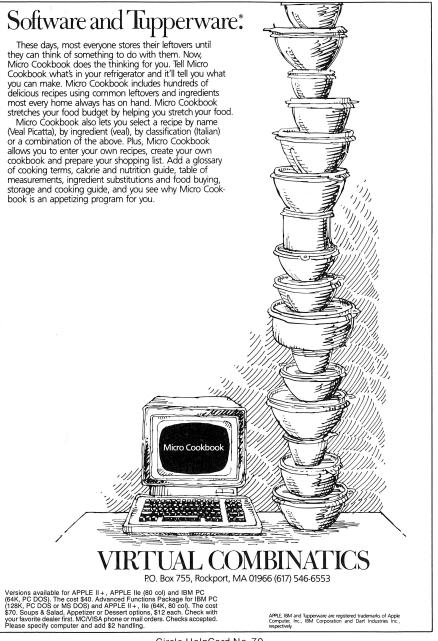
Circle HelpCard No. 155

The International Management Institute, Inc.

300 Lost District Drive

New Canaan, CT 06840 (201) 522-1213

Algebra Arcade provides a whole new formula for having fun while learning or practicing algebra. The game consists of the villainous Graph Gobbler, the auto cratic Committee, the Whirlwind, and ten little critters called Algebroids scattered over a coordinate system. The player's job is to construct an algebraic equation that will zap as many Algebroids as possible with the resulting graph. After entering an equation, the Whirlwind rushes along the path of the graph knocking down the Algebroids and racking up points. But be alert! Collide with the Graph Gobbler and the graph will be devoured, sending the player to the Committee to lose some turns, or, if the Committee is lenient, to return to the game without penalty. Beginners can play just by using straight lines. Math sophisticates can create complicated



curves using the ten algebraic functions provided. User-friendly, with visual and audio prompts, scoreboards and graphs, Algebra Arcade comes with a complete rules and instructions booklet which tells the user how to get started, offers tips on strategy and lists winning equations \$49.95.

Circle HelpCard No. 156 Wadsworth Electronic Publishing Comp. 8 Davis Drive Belmont, CA 94002 (415) 594-1900 (CA); (800) 831-6996

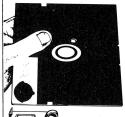
Mastering The College Board Achievement Tests: English Composition is designed as a means to prepare high school students for entrance into selected colleges and to qualify them for advanced placement in college English courses. The five-disk program contains over 1,000 problems that offer practice in rewriting sentences, phrasing, identification of gram matical errors and pointers on sentence structure. This self-paced program provides an approximate score and error analysis to indicate areas for further study \$175.00.

**CBS** Software

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Circle HelpCard No. 157 **CBS** Software

Success With Math series contains four programs that allow students to learn at their own pace and choose the level of difficulty of the problems they wish to solve. The programs are never judgmental, always encouraging, simple to use, and require little or no use of printed materials. Addition/Subtraction is for elementary students and older. It offers practice in the fundamental operations of these two skills, including carrying and borrowing. Multiplication/Division permits users to practice on randomly-generated problems with up to three digits in the divisors or multipliers in each of these skill areas. Linear Equations for students in the seventh through tenth grades can practice on equations in the form: AX + B = C, where A, B, and C are integers. Quadratic Equations for students in the eight through eleventh grades offers practice on advanced math problems with this program. Solving for X by factoring unfolds in logical progression with detailed explanations of errors and problem solutions. Each is priced at \$24.95.

Circle HelpCard No. 158 **CBS** Software Greenwhich, CT (212) 683-7810

#### **Financial**

Farm Ledger farm accounting program for the Apple /// is a translation and enhancement of the same program on the Apple II and IBM-PC computers. The program offers check writing, checkbook reconcilement, and a flexible enterprise analysis. It takes advantage of the Apple / //'s extra memory and special keyboard. Entries can be categorized into 20 income and 40 expense categories, with up to 6 sub-categories each. Open accounts, notes, or investments can be monitored. Other farm programs include Farm Analyst, Depreciation Log, Hog Management Package, Field Manager and Dairy Jour-

Circle HelpCard No. 159 Harvest Computer Systems 102 S. Harrison Street Alexandria, IN 46001 (317) 724-9527

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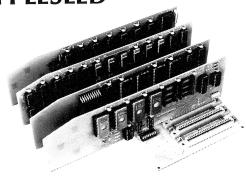
Circle HelpCard No. 160 Turning Point Software, Inc. 11A Main Street Watertown, MA 02172 (617) 923-4441

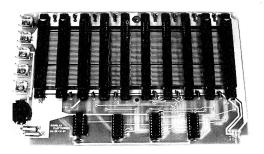
EZ-Ledger uses the simplest form of bookkeeping possible. Single entry bookkeeping requires only posting transactions either under INCOME or EXPENSE. It will keep track of expense items under any one of 99 user selected tax codes plus all ytd and monthly running totals for each of the selected items. Expense items may be entered under DEDUCTIBLE or NON-DEDUCTIBLE type codes. Invoices may be produced with an automatically incremented invoice number and then automatically post the data to an Accounts Receivable holding file or directly to Income and updates all totals. The accounts receivable and payable files are "holding" files with their own running ytd totals. Transactions in these files may be auto matically posted to Income or Expense and all respective totals will be automatically updated. Supports 80 or 132 column printers and one or two disk drives. The printer is needed for producing invoices, but optional on all other reports. Requires 48K RAM, Applesoft ROM and DOS 3.3 \$60.00.

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Design Trends

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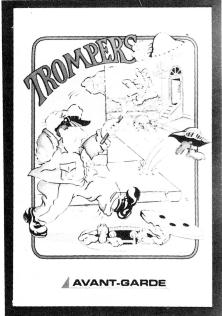


564 Tara Court Manteca, CA 95336 (209) 239-2116

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Avant-Garde Creations, Inc. P.O. Box 30160 Eugene, OR 97403 (503) 345-3043



Geopolitique 1990 is a comprehensive simulation of international diplomacy and military confrontations. As President of the United States in the 1990's, you face a world that is economically troubled and caught up in the tense power struggle between the two major powers, your country and the Soviet Union (played by the computer). The game has two phases, The Diplomatic Phase and The Military Phase. It is a "peaceful" struggle for domination between the U.S. and the Soviet Union. Raw materials (food, energy, metal), military alliances, capital, economic concessions are all exchanged/traded. Your political savvy in international haggling will make or break your attempt to gain world dominance without a shot being fired. The Military Phase simulates conventional (non-nuclear) warfare and boasts realistic features such as air strikes, amphibious landings, air superiority and terrain considerations. Complete with a rulebook, data card and disk with program on both sides \$39.95. Requires any Apple II or the Apple ///.

Circle HelpCard No. 166 Strategic Simulations, Inc. 883 Stierlin Road, Bldg. A-200 Mountain View, CA 94043-1983 (415) 964-1353

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with only a crude map, a cube with ancient markings, and a partial hieroglyphics dictionary. Filled with a series of rooms and chambers with one death trap after another \$49.95. Circle HelpCard No. 167 Infocom, Inc. 55 Cheeler Street Cambridge, MA 02138

Buzzard Bait is a new action game for the Apple II and IBM-PC personal computers. It pits the player against up to 3 pairs of amusing but deadly birds who prey on humans in order to feed their young. The player in his ship is on a rescue mission to save the people from their fate. The game can be played with either a joy stick or a keyboard. Requires any Apple II with disk drive. \$39.95.

Circle HelpCard No. 168 Sirius Software, Inc. 10364 Rockingham Drive Sacramento, CA 95827 (916) 366-1195

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**Exodus** adventure fantasy game is now available at your local dealer. Third in the Ultima saga, Exodus brings a long sought after freshness to fantasy role-playing. Adding dimensions to adventure gaming, Exodus features new animated graphic techniques, full sound effects, and multicharacter interplay. Step into this fantasy world created by Lord British and use your skill and wit to find and destroy the insidious Exodus. For any Apple II \$54.95.

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Circle HelpCard No. 170 California Pacific Computer Co. 757 Russell Blvd. Davis, CA 95616 (916) 756-2921

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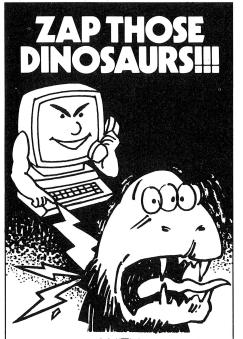
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1700 Solano, Berkeley, CA 94707 Orders: 800-621-3744 (In CA 415-525-4901) Mind Systems Corporation P.O. Box 506 Northampton, MA 01061 (413) 586-6463

Pro Football Stats is a new computerized database and operating program that shows the complete history of every professional football game since 1970. The user selectable programs can incorporate every team's win/loss record, the coach, home or away for every team, the playing surface, and most importantly, it shows every team's record against "the spread". That is the oddsmaker's way of making every game even. The stronger team, or favorite, awards enough points to the underdog, or weaker team, so that in the eyes of the oddsmaker the two teams are evenly matched. It can answer questions like the following in seconds: What is Miami's record against the spread in every game against Buffalo since 1978?; What is a particular team's chance of beating the spread when playing at home after three consecutive wins against the spread?, etc. The operating program and database are regularly priced at \$495.00.

Circle HelpCard No. 174
Eastern Computer Consult'g Ass'n., Inc.
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Worcester, MA 01609
(617) 757-3131

Pentapus is a full feature arcade game for any Apple II with 48K. Your journey begins deep in outer space, in a vast and uncharted region of another universe. To return home, you must control the Stargates between universes. However, each new universe you encounter is guarded by an increasing devilish mutant army. Wave after wave of Drangels, Eagulls, and other mysterious space warriors assault your Stargate. Your only hope is speed and intelligence. It you defeat them, you incur the wrath of the dreaded Pentapus. Utilizes state-of-the-art graphics and incorporates arcade features such as quality sound generation, high-score editing, action freeze/restart at any point, and four separate skill levels, including a kid's level \$29.95.

Circle HelpCard No. 175 Turning Point Software, Inc. 11A Main Street Watertown, MA 02172 (617) 923-4441

Charles Goren: Learning Bridge Made Easy is the first truly tutorial bridge program. Available on disk for any Apple II or IBM-PC, the program teaches bidding, covering such topics as hand evaluation, opening bids, responses and rebids, and provides 100 especially selected hands for practice in play. The computer allows opportunities to make the correct bid before revealing the best answer and explaining it. Complete with a 144-page book that teaches both bidding and play of the hands \$79.95.

Circle HelpCard No. 176 CBS Software

Match-Wits is a challenging game of memory, logic, and strategy, for any Apple II. On disk for one to four players, it actually lets players program in additional files of their own devising. Players of all ages must draw on their mental storehouses of facts in any of six categories: words, sports, famous people, multiplication, cities, and animals, to match factpairs and uncover pieces of a rebus or picture puzzle. Whoever can identify the puzzle first wins bonus points. Players can add 16 pairs of facts for new rounds in each category or they can create new files of fact-pairs in new categories \$29.95. Circle HelpCard No. 176

Murder by the Dozen is a unique logic and deduction game playable by up to four would-be detectives. It challenges the player to investigate and unravel 12 cases of murder. The sleuth is provided with a dossier on the crime, a map of Micropolis, and a clue book containing hundreds of numbered clues. It is up to each player to decide where to look for clues and whom to interview. As facts of the case are uncovered, they may become part of the police lab report and can be referred to at any time. Full of false leads that could take the player on a lengthy wild goose chase \$34.95.

Circle HelpCard No. 176 CBS Software Greenwich, CT (212) 683-7810

CBS Software

The Bible Adventure Game Series first game is The Philistine Ploy. Based on the biblical Book of Judges, it starts at a time when law and order have fled from the hills of Judea. It's a turbulent world of intrigue and revenge, altars and idols, heroes and justice. You'll seek the longlost mythical Treasure of the Seven Nations, racing against a dangerous Philistine warrior who is trying to kill you. The story is filled with people, places and amazing events right out of one of the world's oldest history books - The Bible. With stirring action, startling sound and dazzling sights. Realistic animation and hi-resolution graphics. For the Apple II or //e \$34.95 plus \$2.00 for shipping.

Circle HelpCard No. 177 Davka Corporation 845 North Michigan Avenue Suite 843 Chicago, IL 60611 (800) 621-8227

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Circle HelpCard No. 178 Sensible Software. Inc. 6619 Perham Drive West Bloomfield, MI 48033 (313) 399-8877

Navette is a sophisticated pattern design tool for handweavers - for the Apple II and //e computers. Navette allows the user to easily create warp and weft drawdowns which can be stored on diskette and combined to produce new and unusual block patterns. In the analysis mode, the user edits a pattern and its threading, treadling and tie-up are produced automatically by Navette. This unique program uses the Apple's high resolution graphics permitting 16 harness patterns with warp repeats to 66 threads and weft repeats to 48 picks. Two pattern display sizes are available: 140 x 96 and 70 x 48. Navette's coloreffect capability means that individual warp and weft threads may be designated as light or dark, significantly increasing pattern possibilities. Combined with a printer, Navette can produce full pattern drawdowns simulating tight or open weave effects. Any graphics character may be used to represent dark threads in the drawdown printout. Requires 64K RAM and one disk drive \$39.95.

Circle HelpCard No. 179 Opcode Software 1909 1/2 Vine Street Berkelev, CA 94709 (415) 525-6997

Charts Unlimited is a new software product that offers many computer aided drawing features normally found only on systems costing \$20,000 - \$40,000. This new \$195.00 software package will run on any Apple //e or II Plus with 64K. Charts Unlimited lets users define their own objects. The package starts wth 36 predefined objects and 36 predefined symbols. But users can create their own "alternate" objects - up to 26 in one file, and there's no limit on the number of files. Easy to use to draw flowcharts, floor plans, organization charts, engineering drawings, electrical schematics, forms, PERT charts and virtually any type of chart. Charts created can be quickly changed, rearranged, enlarged, replicated or overlayed onto other charts. Completely menu driven with built-in HELP screens to answer most user questions.

Circle HelpCard No. 180 Charts Unlimited 5084 Mosiman Road Middletown, OH 45042 (513) 424-6733

#### Languages (Programming)

BASIC Extension for the Apple /// permits you to change file types, gives you Reset protection and provides some high speed disk routines that are up to 10 times faster than BASIC. Allows access to any block on a disk. Features array manipulation, insert/delete elements, move sections of arrays, search arrays. Includes a Character Set Editor to permit you to create your own character sets. Complete instruction manual \$95.00.

Circle HelpCard No. 181 **Foxware Products** 165 West Mead Avenue Salt Lake City, UT 84101 (801) 364-0394

Modula-2 is the advanced new programming language which evolved from Pascal. The module concept is the major enhancement beyond Pascal. This allows programmers to develop large programs composed of small modules which are kept in a program library. Because each module is divi-

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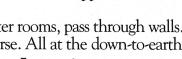
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#### GRAPHICS PRINTER INTERFA

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Microtek's proprietary on-board firmware enables the **Dumpling-GX** to establish intelligent communication between your Apple computer and your printer. Simple commands allow:

- Selection of your printer by DIP switch.
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The Dumpling-64 allows full use of all Dumpling-GX features. In addition to the standard graphics features, the Dumpling-64 offers:

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ded into a definition part and an implementation part, any module may be modified without affecting its interface to the rest of the program. Unlike earlier languages, Modula-2 does type checking between separately compiled program sections. It has low-level facilities which allow direct access to the computer hardware and allow circumvention of strong type checking. This new language also has multiprogramming features - signals, monitors, process creation \$100.00 Circle HelpCard No. 182 JRT Systems, Inc. 45 Camino Alto Mill Valley, CA 94941

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The Home Controller is a flexible, user friendly scheduling program that remotely and wirelessly controls household appliances and lighting via the BSR (or equivalent) ultrasonic console. The program is written in Pascal and operates on any Apple II. Scheduled events can occur at regular intervals, at preset times, or randomly or periodically within a time interval. Events can even be scheduled at variable times such as sunrise or sunset because it contains an almanac that calculates the time of daily sunrise and sunset specifically for the user's location. The schedule can be set up to a year in advance by specifying particular months, dates or days of the week. Two versions are available, priced at \$40.00 and \$55.00 (Advanced version features 100 events, user insertable logic, the capability to maintain schedules with the Pascal editor, and dependent events and requires a 16K RAM card and Apple Pascal 1.1).

Circle HelpCard No. 185 Infeld Software 2422 Alvin Street, SUite 100 Mountain View, CA 94043

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Circle HelpCard No. 188 XPS, Inc. P.O. Box 140 Carlisle, PA 17013

Now, with the new "Attach" driver, you can print any text from the screen of your Apple /// to your printer with one keystroke. Permits you to dump a screen full of text from any program at any time to any printer. You also gain the ability to switch between normal and condensed print with a single keystroke \$29.95 plus \$1.50 postage and handling.

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#### **BOOKS/CATALOGS**

Applesoft Language (Second Edition) uses non-technical language to guide Apple II (any type) users through the syntax and programming of Applesoft BASIC. Everything from the fundamentals of loading and saving programs on tape through advanced programming tech-



niques is covered, including rules and tips for efficient programming and problem solving. It shows how to use flow charts, graphics, color commands, and much more. New material in the second edition includes thorough coverage of disk operations, plus expanded examples, charts, tables, vocabulary list and more \$13.95. Circle HelpCard No. 191 Howard W. Sams & Co., Inc.

The Easy Guide to Your Apple II by Joseph Kascmer, was written for the person who doesn't want the burden of jargon or theories, but wants to use the machine as an extension of his own mind. Clear explanations, illustrated by sample programs, show the reader how to use the computer for word processing, calculations, filing, and more. The book covers programming in BASIC and getting started with commercially available software. Written in a friendly, jargon-free style that teaches you everything you need to know about beginning Apple computing. 160 pages \$9.95.

Circle HelpCard No. 192 Sybex 2344 Sixth Street Berkeley, CA 94701 (415) 848-8233

The Minute Manual For DB Master by David Einhorn contains practical explanations, informative tutorials and sound advice along with step by step instructions for creating and using a data base. The Minute Manual's goal is to get you working with your software at the highest possible skill level in the shortest amount of time. Two tutorials are presented, one simple and one complex. These tutorials will instruct you from the simple tasks of designing a data base to the powerful features of searching, sorting, report generation, and file restructuring that many have found impossible to comprehend on their own. The Minute Manual for DB Master is a valuable guide for beginners and experienced users alike \$12.95. Disk with sample data bases \$6.00 Circle HelpCard No. 193 MinuteWare

The Minute Manual For Apple Writer / /e by Jim Pirisino is an easy user's guide for the most popular software program for the Apple //e computer, containing step by step instructions for the basic and advanced procedures. The book unravels the mystery of the dot matrix printer by explaining how to access the printing commands for the top selling dot matrix printers. The Minute Manual is designed to get you started using your computer to do word processing fast without needing to read computer, software and printer manuals. It gets you working at the highest possible skill level in the short est amount of time \$7.95. Glossary Disk containing commands for top selling dot matrix printers \$6.00.

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Circle HelpCard No. 194 Reston Publishing Co., Inc. 11480 Sunset Hills Road Reston, VA 22090 (703) 437-8900

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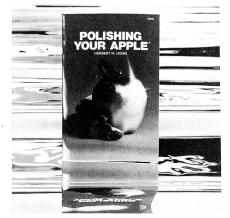
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Polishing Your Apple, Volume 1 uses a lucid self-instructional format to guide the reader from elementary to advance programs. A number of programming concepts and applications are presented in simple terms. The guide covers procedures for writing, disk filing, printing, and using different printers. Sample programs with practical utility give the user a base on which to create his own individual programs. Minimum system requirements are an Apple II

with Applesoft, one disk drive, and an 80column printer \$4.95. Circle HelpCard No. 191 Howard W. Sams & Co., Inc. 4300 West 62nd Street Indianapolis, IN 46268 (317) 298-5400



Apple II Computer Graphics by Ken Williams is a first-of-its kind text. It offers the complete range of the most current graphics techniques, from placing dots on the graphics screen to artificial color generation, animation, and even sophisticated bytemove techniques. Written in an easy to read, self study style, it's the only text users need to create spectacular high quality computer graphics - without Assembler or machine language skills. It includes a complete explanation of the Apple II and IIe graphics, state-of-the-art graphics techniques, a complete section on business and technical graphics, stimulating end-of-chapter exercises, examples in Assembly language for advanced users, and a complete glossary and continual cross-referencing throughout. 150 pages, paperback, 1983, \$19.95. Diskette only \$12.50. Both for \$39.95.

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The Survival Kit For Apple Computer **Games** is a lighthearted and informative look at more than two dozen of the best selling computer games for the Apple computer. It covers 24 games in 4 different categories - adventure, arcade, fantasy and strategy - with an overview chapter on each category and a complete, understandable and humorous description of each game. Designed to assist the beginner with basics, the book includes advice on selection and purchase of computer games, along with a quality rating of the games based on the personal experience and opinion of the authors. Each listing includes detailed descriptions which set the scene, recommend procedures for having fun while winning, inside tips from expert players, programmers and game designers, and a hints and strategies section. Examples of games in the book are Deadline, Cranston Manor, David's Midnight Magic, Apple Panic, Sabo-

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Circle HelpCard No. 202 Computer Accessory Products Company 12058-G Centralia Road Hawaiian Gardens, CA 90716 (213) 402-8333



Now you can protect your complete Apple II and /// systems from tampering and theft with two proven security designs. The Pro-Tech II secures the Apple II and cover, up to three disk drives, any type of monitor or TV, and is compatible with the popular external fans as well as securing them \$155.00. Pro-Tech /// secures the Apple /// and cover, up to three disk drives or a Profile hard disk, and any size monitor or TV \$165.00. The Pro-Tech Lockin Stands feature a unique rear locking system that

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Circle HelpCard No. 201 Segull Enterprises 88 West Britannia Street P.O. Box 869 Taunton,MA 02780

Now you can have locked storage for 51/4-inch floppy diskettes. This new product features a hinged lid, two built-in carrying handles, and comes complete with interior dividers. The rugged MDT070 tray is injection molded of high impact plastic for maximum protection of valuable data. Circle HelpCard No. 203 Ring King Visibles, Inc. 2210 Second Avenue P.O. Box 599 Muscatine, IA 52761 (319) 263-8144



A new combination diskette label and storage envelope is now available for both 51/4-inch and 8-inch diskettes. Link-Labels utilize a serialized, two-part sticker label to visually "link" individual diskettes to specific protective envelopes which incorporate user labeling on the front and back sides. The empty labeling envelope can be referred to or written upon with ordinary pens or even pencils and erased, while its diskette is inaccessible in a disk drive. Available in 5 different colors, special serial numbering for inventory purposes or personalized ownership lines can be custom printed on the two-part "linking" stickers. Each sticker part allows space for diskette name, and the envelope has a separate heading area to identify customer or application. A trial sample in either size is \$2 postpaid. Volume pricing begins at 36 cents each and packaging is in dozen lots.

Circle HelpCard No. 200 Hexco, Inc. P.O. Box 199197 Hunt. TX 78024 (512) 238-4404



Omni-Lock is a new security shelf system designed for Apple II, Apple /// or IBM-PC computers. The unit provides total "lockdown" of keyboards, dual disk drives and monitors through a single lock on the shelf spindle. Omni-Lock shelves will individually swivel 360 degrees to allow complete access to internal cards or components of the computer and disk drives. Rotation of the shelves also permits repositioning of individual components for maximum user convenience. Shelves are designed to blend in with the computer elements in order to save space and allow full ventilation. One key allows the entire unit to be unlocked and moved as a single assembly, less subbase. Retail prices range from \$339.00 to \$419.00. Quantity discounts available. Circle HelpCard No. 204 Micro-Metrics, Inc. 908 South Claremont Street



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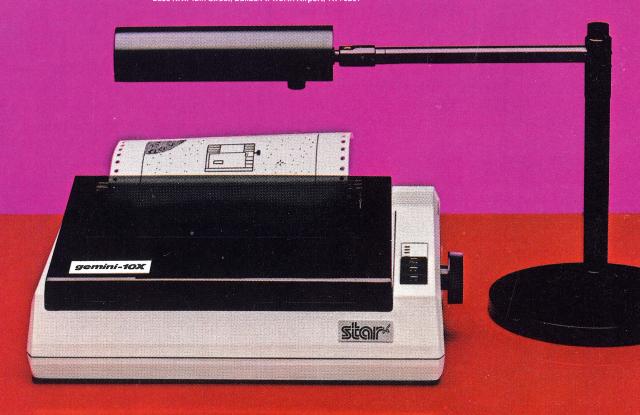
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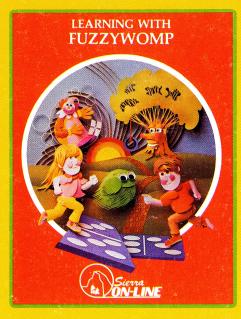


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